TANAPAG VILLAGE

PCB REMEDIATION

RECORD OF DECISION

Prepared for

Department of The Army
U.S. Army Engineer District, Honolulu

October 12, 2001

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1.1 SITE NAME AND LOCATION

The name of this site is Tanapag Village PCB Contamination. It is located in the Village of Tanapag, Saipan Island, Commonwealth of The Northern Mariana Islands. This site is not on the National Superfund Database; therefore, no identification number has been assigned.

1.2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the Selected Remedy for the Tanapag Village PCB Contamination site, in Tanapag, Saipan, CNMI, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), 42 U.S.C. Section 9601 et seq. and, to the extent practicable, the National Oil and Hazardous Contingency Plan (NCP), 40 C.F.R. § 300 et seq. and 10 U.S.C. 2701 et seq. for the United States Department of Defense (DOD) Environmental Restoration Program. The United States Army Corps of Engineers (USACE) issues this Record of Decision pursuant to § 104 of CERCLA and has selected the remedial action in accordance with § 121 (e) (i) of CERCLA, and no federal, state, or local permit shall be required for the portion of any remedial action conducted entirely onsite, when such remedial action is carried out in compliance with section 121. This decision is based on the Administrative Record for this site.

The Commonwealth of the Northern Mariana Islands (CNMI) concurs with the Selected Remedy. The United States Environmental Protection Agency (EPA) has provided concurrence on the final remedy through approval of the proposed treatment under the EPA Administrative Order related to this site.

1.3 ASSESSMENT OF SITE

The response action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances to the environment.

1.4 DESCRIPTION OF SELECTED REMEDY

The remedial action is to treat 20,000 tons of stockpiled contaminated soil on site with indirect thermal desorption technology (ITD). The residual filter cake from the ITD process will be about 400 tons of PCB contaminated material, which will be shipped to the US mainland for disposal in a TSCA certified landfill. The remedial action addresses the principal threat at the Tanapag Village PCB Contamination site by removing the PCBs present in soils stockpiled at the site thereby significantly reducing the mobility and volume of PCBs in the environment. This particular treatment process will not change the toxicity of the PCBs. This action represents the final remedial action to remove PCBs from stockpiled soils on the site. The selected remedy is Alternative 4E described in the Focused Feasibility Study and Proposed Plan. It will require approximately 6 months to complete the thermal desorption of 20,000 tons of contaminated soil and ship the concentrated PCB residuals to the U.S. Mainland for disposal. The estimated cost of the remedy is $6,764,100. The major components of the selected remedy shall include the following:

- Crush and size contaminated soil and debris to minus 2 inches
- Sized contaminated soils and debris shall be treated in an indirect thermal desorption (ITD) unit to remove PCBs to 1.0 ppm or less and released for unrestricted use
- Volatilized water will be treated and used to re-hydrate treated soils
- Contaminated residuals from the ITD process will be collected, packaged in appropriate containers and shipped to the U.S. Mainland for disposal in an appropriate facility.
- The site where the soils were stockpiled and treated will be restored to a natural condition

1.5 STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and CNMI requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions, proven technologies to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Because this remedy will not result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a five –year review will not be required for this remedial action.

1.6 ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record for this site.

- Contaminants of concern and their respective concentrations
- Summary of site risks
- Current and potential future site and resource uses
- Remedial Action Objectives
- Estimated capital expenditures
- Key factor(s) that led to selecting the remedy

1.7 AUTHORIZING SIGNATURES

Ronald N. Light (signature) — November 1, 2001

Ronald N. Light — Date

Lieutenant Colonel, U.S. Army

District Engineer

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

The site name is Tanapag Village PCB Contamination. The stockpiled soils that require remediation are located in Tanapag Village, which is along the northwestern coastline of the Island of Saipan, CNMI. The Marianas Islands are located in the Western Pacific at approximately Latitude 15°15'N, Longitude 145°45'E. Tanapag Village covers approximately 1.2 square miles and is situated between West Coast Highway and Tanapag Lagoon, approximately 3 miles northeast of the Town of Garapan. Figure 1 depicts the location of the Island of Saipan and Tanapag Village in the CNMI.

Of the Phase III Sites, the largest Site excavated is located in the Main Cemetery (Cemetery 2 or C2), which is located directly between Tanapag Village and Garapan, approximately 1.6 miles northeast of the Navy Hill intersection in Garapan. C2 is a rectangular area consisting of approximately 2.3 acres. The remaining excavation Sites were in clusters throughout the Village at locations near the shoreline, inland, and to the north of the Village.

The soils excavated during the Phase III removal action from the Sites described above and in Section 1.2.1 are currently stockpiled in the storage cells shown on Figure 2 awaiting remedial action.

The recent Phase III removal action and the EE/CA Investigation have identified the Phase III Removal Sites as follows:

- Cemetery 2 (C2) – Main cemetery area and narrow areas across the road on the west and south;
- Beach/Park Areas in Tanapag Village – Sites near the shoreline, mostly in public areas;
- Public Properties in Tanapag Village – Head Start Center, Cemetery 1, and adjacent Sites;
- Private Residences – Numerous private residences with lots in Tanapag Village; and
- Potted Plants and Planters – Sites to which soil was transported from C2.

The lead agency for this site is the United States Army, Corps of Engineers Honolulu Engineer District. The source of funds for this remedial action is the Defense Environmental Restoration Program Formerly Used Defense Sites.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Between 1968 and 1974, an unknown number of electrical capacitors were transported from Public Works Yard (PWY) to Tanapag Village to be used as a perimeter around the Village ballpark/community hall area. Some of the electrical capacitors were also used for a barricade against vehicles entering the Village through Tanapag Beach Park. While the exact year that the capacitors were placed in Tanapag Village is not known, several older residents recall their arrival after Typhoon Jean hit the island in 1968-69. Individuals who were involved in transporting and placing the capacitors in Tanapag Village recall that the capacitors were brought into the Village in 1972. As a result of a typhoon that struck Saipan in the late 1970s, the capacitors became scattered throughout the Village.

DEQ was notified of the presence of numerous cylindrical electrical components in Tanapag Village in December 1988. Upon notification, DEQ field technicians conducted an investigation by collecting samples of the liquid contained within the cylinders. These samples were analyzed, and reported that approximately 60 percent of the samples had concentrations of the PCB Aroclor 1254 that exceed the federal action level.

In 1988, the DEQ, with technical assistance from EPA, removed the capacitors from Tanapag Village, bringing them to the PWY for storage in 55-gallon drums to await proper disposal. The drums were stored outside under a tarp. A total of 53 capacitors were removed in 1988; another two were removed from the Village by DEQ in 1991. The capacitors are cylindrical ceramic vessels containing phenolic windings soaked in PCBs and are approximately 4 feet long with an 18-inch diameter.

At the request of the EPA, the USACE began a preliminary assessment of Tanapag Village and initiated removal of the capacitors from Saipan in 1990, under the authority of the DOD Formerly Used Defense Sites (FUDS) program. In August 1992, the USACE initiated Phase I soil removal from Tanapag Village at Site locations identified during preliminary assessment sampling activities, including the Lower Base Yard Excavation. Off-site disposal of 180 tons of PCB-contaminated soils mixed with capacitor debris was completed during Phase I.

In March 1994, the USACE began Phase II of the response action and removed an additional 1,730 tons of contaminated soil from Tanapag Village and C2. This soil was treated on site using a Thermal Blanket Process and PCB Destruction by a thermal oxidation process. Remediated Sites were backfilled with quarry-supplied crushed, coral fill, or the treated soil. Approximately 4,000 cubic yards of contaminated soil was left in place at C2 and covered by a layer of crushed coral. Five hundred and forty nine tons of soil was disposed of off site (U.S. mainland). Twenty Sites were identified during Phase II. The C2 Site was the only remaining Site with PCB contamination greater than 10 parts per million (ppm).

EPA collected additional soil samples identifying new areas of PCB contamination in May 2000. Phase III of the project initiated shortly thereafter with ECC performing characterization at various sites in Tanapag Village, under the direction of USACE (ECC 2001). This removal action was undertaken by the USACE pursuant to a decision to conduct a time critical removal action in an Action Memorandum signed by the Division Commander, Pacific Ocean Division on July 21, 2000. Phase III included excavation of all identified PCB-contaminated soils and stockpiling of the material from approximately 23 Sites identified during Phase III removal activities. The amount of contaminated soil stockpiled and awaiting treatment and/or disposal is approximately 20,000 tons. Two samples were collected from each stockpile. The PCB concentrations from these samples tested between 4 and 67 ppm, although pockets of higher levels of contamination are assumed to be present in the stockpiles.

An Final Administrative Order was issued to U.S. Department of Defense/Depart of the Army by the United States Environmental Protection Agency, Region IX, pursuant to Section 7003 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA, and further amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA, 42 U.S.C. Section 6973.

The work to be performed under the order includes:

- Excavation and Storage of PCB contaminated soil and debris from 25 existing sites within Tanapag Village.
- Treatment of Contaminated Soil and Debris using a method(s) approved by EPA
- Disposal of PCB Residuals with concentrations greater than 1.0 ppm in accordance with TSCA
- Investigation of Groundwater at the Site to determine the nature and extent of PCB contamination

2.3 COMMUNITY PARTICIPATION

The Focused Feasibility Study and the Proposed Plan for the Tanapag Village PCB Contamination Site were made available to the public in July 2001. They can be found in the Administrative Record and in the information repository maintained at the USACE Honolulu District Office in Hawaii, and in the Joeten-Kiyo Library, Susupe, Saipan. The notice of the availability of these two documents was published in the Saipan Tribune on July 3, 2001. A public comment period was held from July 3, 2001 to August 3,2001. In addition a public meeting was held on July 11, 2001, in Tanapag, Saipan to present the proposed plan to a broader community audience than those that had already been involved at the site. At this meeting Representatives of the USEPA and the USACE answered questions about problems at the site and the remedial alternatives. The USACE response to the comments received during public comment period is included in the responsiveness summary that is party of this Record of Decision.

2.4 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

There are no operable units for this site. The specific activity addressed by this ROD is the remediation of 20,000 tons of soil and debris excavated from Tanapag Village. The soil and debris has been stored in 12 temporary cells located adjacent to Cemetery Number 2 in Tanapag. The stockpiled soil and debris is contaminated with the PCB Aroclor 1254. PCB 1254 is the only contaminant of concern. However, the treatment process will destroy all PCB Aroclors that may be present in the soils.

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The Final Administrative Order, issued December 20, 2000, by the USEPA established a cleanup standard of 1 milligram/kilogram (mg/kg or ppm) PCBs for soil or other materials to be treated and released on Saipan, based on TSCA. Soil or other materials exceeding the cleanup standard are to be disposed of off island at a permitted disposal site.

The remediation of the stockpiled soils is a multiple step process:

- Contaminated soil and debris will be treated in an ITD unit to remove PCBs
- The treated soils will be placed at a location in Saipan
- The contaminated residual waste containing solids and concentrated PCBs above 1 ppm will be placed in containers and shipped to the U.S. Mainland for disposal.

2.5 SITE CHARACTERISTICS

Most of Tanapag Village is located on several hundred acres of low-lying coastal areas, which were partially filled and developed with single-family residences. Surface elevations range from sea level to approximately 12 feet above sea level. Some village residences and farms are located in the hills, East of the West Coast Highway. It is here where elevations are higher. The landscape slopes gently to the west towards the ocean. The Village covers an area of approximately 1.2 square miles along the northwestern coast of Saipan (Figure 1). All of the known PCB contamination locations in Tanapag Village have been remediated to less than 1.0 ppm. The last of the excavated soil from this remediation is presently contained in 12 stockpiles located on a parcel of land adjacent to Tanapag's Cemetery 2. The parcel is approximately ½ acre in size and is located at the southern boundary of Tanapag Village. The remediation of these 12 stockpiles is the subject of this ROD.

Saipan and the other islands of the Mariana Chain are situated in a double-arc, convergent plate margin setting. Large-magnitude, deep focus earthquakes and volcanism are still common throughout the northern portion of the Mariana Islands. Island arc volcanism is characterized by pyroclastic eruptions of andesitic and dacitic composition. Geological studies of the Mariana Chain indicated that the frontal arc of the system consists of Eocene to Miocene age volcanic rocks that are locally interbedded, and overlain by shallow water limestone and other sediments (Woodward-Clyde Consultants 2001).

The volcanic rocks on Saipan were placed into four formations by Cloud et al. (1956). Three of the four volcanogenic formations (Sankakuyama, Hagman, and Densinyama) comprise the "basement" rock encountered on Saipan. The Fina Sisu formation volcanics were placed in the middle of the stratigraphic section above the Matansa limestone unit (Woodward-Clyde Consultants 2001).

The majority of the volcanic material exposed on Saipan erupted in a submarine environment. Volcanism on Saipan is believed to have ended in the Oligocene epoch (25 to 38 million years before present). Because of the island's location within the arc system, the island has undergone significant tectonic uplift. Subsequent subaerial exposure of the volcanic basement rock led to erosion and reworking of the original volcanic material to produce clastic sediments. These sediments have become cemented to form sandstones, conglomerates, and breccias of low porosity. Tectonic uplift of the island has also led to the formation of thick fringing limestone units that are exposed at elevations up to 1,540 feet above msl on the summit of Mount Tagpochau. Thus, the island consists of an andesitic-dacitic volcanic core overlain by sandstones, conglomerates, and breccias, which are, in turn, capped by limestone. Roughly 90 percent of the surface of the island is currently mantled with limestone (Woodward-Clyde Consultants 2001).

According to Cloud et al. (1956), recently emerged limestone sands underlie the Tanapag coastal plain. The southeastern area of the coastal plain consists of a low terrace of quartz-rich tuffaceous sands and gravel that are mapped as "younger terrace deposits." These two units form a thin veneer (10 to 230 feet thick) that increases in thickness inland, and overlies the Pleistocene Tanapag Limestone. The Tanapag Limestone overlies the Miocene Tagpochau Limestone, a pink, white, and variegated, clastic limestone that is generally free of volcanic debris.

Groundwater in the northern portion of Saipan occurs as an unconfined brackish water lens that overlies saltwater. The regional aquifer at the subject site is made up of the coral and coral-derived material of the Tanapag formation. Due to the high permeability of this limestone unit, the water levels within this aquifer fluctuate with ocean tides. Historically, limited amounts of generally brackish water have been exploited by dug wells along the coastal plain.

At the inland margin of the study area, the Tanapag Limestone is overlain by alluvium derived from the weathering of the Hagman Formation Volcanics that are exposed in the upland region of the study area. Extensive faulting of the limestone and the volcanic units has occurred in these inland areas. The volcanic units have low permeabilities and are not typically exploited as sources of groundwater on Saipan. Springs in the Talafofo area appear to emanate from local, slightly permeable units within the volcanics. The Japanese constructed small catchment reservoirs at two springs in the area, one at Bobo Agatan and the other at Bobo Mames (Woodward-Clyde Consultants 2001).

The site investigations conducted in Tanapag have focused on the location of the capacitors and on the nature and extent of PCB contamination resulting from leaking or destroyed capacitors. The capacitors contained pure Aroclor 1254.

When the capacitors were removed from the village by DEQ in 1988, each location was clearly marked. A limited number of soil samples were taken and it determined that PCBs had contaminated soils in locations where leaking or destroyed capacitors were removed. All of the subsequent investigations of the extent PCB contamination in the village were tied to the locations were capacitors were found and then expanded outward until no PCBs were found in analyzed samples. In this way the vertical and horizontal extent of contamination was determined for every location were capacitors were found and removed. The investigations were limited to soil only as there was no evidence from the soil contamination data to suggest the PCBs had reached the shallow groundwater.

The Contaminants of Concern (COCs) are defined as the chemicals that represent a threat to human health and the environment, and are selected based on their mobility, persistence, toxicity, location and concentration distribution at the site. The chemical driving this Removal Action is the PCB Aroclor 1254. The dielectric fluid used by the capacitor manufacturer consisted of pure Aroclor 1254. Therefore, the PCB Aroclor 1254 is the only chemical considered as a COC, although all PCB Aroclors will be remediated in this action. PCB is a suspected carcinogen and bio-accumulates in animal species towards the top of the food chain. PCBs are insoluble and are heavier than water. Different Aroclors are likely to be present in Tanapag and elsewhere in Saipan because PCB transformers have been in use in Saipan as far back as the Japanese administration of the island.

The amount of soil to be addressed by this response action is 20,000 tons of excavated soil containing the PCB Aroclor 1254. The soils have been stockpiled into 12 aboveground storage cells constructed from PCB resistant, impermeable, waterproof material. Each cell is fully enclosed and contents isolated from the environment and from the weather. The stockpiles do not offer any potential for human or environmental exposure to PCBs as long as the cells remain intact and completely covered.

2.6 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Primarily a residential community, current census data show that Tanapag is the smallest village on Saipan, with 323 households and a population of 1,747 (Department of Commerce & Labor Statistics 1995). The Village has a school, church, cemetery, Head Start Center, and a beach park. Many of its present residents are genetically related, sometimes with as many as four generations living in one household. The community is largely Catholic and economic pursuits of village residents are similar to most other Saipan villages, with people involved in government employment, tourism, fishing, agriculture, and transportation (Edward K. Noda and Associates 1999).

The Village roads are mostly coral-covered with some interspersed paved roads. Many residences have rooftop rain-collection systems. Residents raise chickens, pigs, goats, and cattle, and grow vegetables such as taro roots and yams. Various perennial fruit-bearing trees, including breadfruit, banana, coconut, lime, guava, papaya, sour sap, and betel nut thrive within Tanapag Village and are a source of food for the residents. Land crabs are frequently collected and consumed, and clams and several species of fish are harvested from Tanapag Lagoon.

Tourism is an important source of income, and many visitors are taught scuba diving at the public beach area in the park in Tanapag Village. Many archeological sites exist in the Tanapag area close to the shoreline where World War II burials, artifacts, and buried ordnance are located within the top 2 feet of soil.

Adjacent land use immediately to the south of Tanapag includes both industrial and manufacturing activities, government warehouses and offices. Industrial and manufacturing activities include a cement plant, garment factories, scrap metal yard, power plant and shipping warehouses. Village farmland extends to the east of the Marpi Road and interspersed with residences and garment factories to the base of the low foothills to the east. The land north of Tanapag is populated with small clusters of residences, often referred to as Ashugao and eventually be several lagoon front resort hotels.

It is unlikely that future land use will change dramatically. As the permanent resident population of Saipan increases Tanapag has the potential to increase in population resulting in the construction of additional residences. Garment factories continue to be constructed in Tanapag. It is reasonable to expect that some of these may be constructed in the vicinity of Tanapag. The parcel upon which the stockpiles are presently located is adjacent to the Main Cemetery in Saipan. Once the soils have been processed and the stockpile cells removed, the storage site will be sampled to ensure that no contamination is left behind and returned to open space.

There are no surface water impoundments on the site or anywhere adjacent to it. Groundwater is present at the site. However, the proximity of the site to Tanapag lagoon causes the groundwater to be unsuitable for human or livestock consumption and for agriculture use due to the high salt content.

2.7 SUMMARY OF SITE RISKS

The Army was directed in EPA's RCRA 7003 order to achieve a cleanup level of 1.0 ppm of PCBs in soils for the Phase III Removal Action, in lieu of performing a health risk assessment. The USEPA ordered the Corps to meet the cleanup level of 1.0 ppm in the Final Administrative Order issued December 20, 2000. This standard is consistent with the Toxic Substances Control Act.

The treatment, storage and disposal of PCBs are regulated under the Toxic Substance Control Act (TSCA), as described in Title 40 of the Code of Federal Regulations (CFR) Part 761 (revised 7/1/99). TSCA requirements are applicable to materials that contain PCBs in concentrations equal to or greater than 50 ppm.

2.8 REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives are to:

- Reduce PCBs in Stockpiles to 1.0 ppm or less.
- Properly dispose of the treatment residuals that contain PCB 1254 above the cleanup level at a TSCA compliant disposal facility on the United States Mainland.
- Comply with the EPA Order issued December 20, 2000.

2.9 DESCRIPTION OF ALTERNATIVES

Remedial alternatives for the Removal Action are presented below. The alternatives are numbered to correspond with the numbers in the FFS.

COMMON ELEMENTS

A majority of the remedies considered in the FFS require thermal treatment to reduce PCB concentrations in the contaminated soil to less than 1.0 ppm. The residual materials from these thermal processes contain the recovered PCBs in a concentrated form and may be disposed of either off the Island or further treated on-site to destroy the recovered PCBs

The criteria used in evaluating the remedial alternatives include the following:

- Overall protection of human health and the environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume
- Short-term effectiveness
- Implementability
- Cost
- The two additional criteria of state and community acceptance are evaluated as part of this final remedy selection decision and will be discussed later in this decision document.

CERCLA and the NCP mandate that these criteria be used as the basis for a proposed remedial action decision. The following ten remedial alternatives, organized into three groups and the No Action alternative, were evaluated for the Phase III Tanapag Village Remedial Action:

REMEDIAL ALTERNATIVES

Alternative 1: No Action

Estimated Capital Costs: $1,039,500
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: $1,039,500
Estimated Time Frame: Immediate
Estimated Time to Achieve Remedial Action Objectives: Immediate

The No Action Alternative described here is not a true no action alternative. A typical no action alternative would normally specify no remedial action and have no capitol cost. Pursuant to the July 21, 2000 Time Critical Removal Action, the Corps has excavated 20,000 tons of contaminated soil and stockpiled this material on the site. Therefore, the No Action response consists of implementing no remedial technology or process to reduce or minimize the volume, toxicity or mobility of the PCBs in the soil, but may include environmental monitoring and/or institutional controls. In this particular case, the No Action alternative includes the covering the 12 existing soil stockpiles at their present location with additional high-density polyethylene

(HDPE) and a 6-inch layer of crushed coral, and maintaining them at this location indefinitely. The stockpiles would require a certain degree of maintenance for the life of the alternative. Such maintenance could include repairs of the plastic containment system and control of surface water and erosion. Installing a network of monitoring wells that are sampled on a periodic basis would monitor impacts to underlying groundwater. The designated stockpile area would need to be secured by fencing to prevent the public from entering the area. Furthermore, the designated area may have to be appropriated for ownership by the government for the life of the alternative. The implementation of this alternative is assumed to be exempt from any permit requirements in accordance with CERCLA.

Alternative 2A: Off-Site Disposal

Estimated Capital Costs: $18,456,900
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: $18,456,900
Estimated Time Frame: 8 months
Estimated Time to Achieve Remedial Action Objectives: 12 months

Alternative 2A consists of off-site disposal to a licensed treatment, storage, and disposal facility (TSDF), of the stockpiled soils that have been excavated from areas where PCBs detected in soils exceeded 1.0 ppm. The excavated areas were backfilled with clean, imported soil. In this alternative, the contaminated soil would be packaged in Department-of-Transportation (DOT)-rated containers or sacks, typically with a rated capacity of 1-1½ cubic yards. The individual sacks would be loaded into 20-foot shipping containers and transported by ocean carrier to the United States mainland for disposal at an appropriate disposal facility.

Alternative 2B: Off-Site Encapsulation with Stabilization

Estimated Capital Costs: $4,460,000
Estimated Annual Operations and Maintenance Costs (O&M): $5,000
Estimated Present Worth: $4,460,000
Estimated Time Frame: 4 months
Estimated Time to Achieve Remedial Action Objectives: 10 to 24 months

Alternative 2B consists of the off site disposal of stockpiled soils to a TSCA compliant waste management unit constructed in Saipan to permanently contain TCB impacted soils. The base of the waste management unit would be designed with a primary and secondary flexible membrane liner (FML) system consisting of 60-mil high density polyethylene (HDPE), and leachate collection and leak detection and removal systems. Contaminated soils would be stabilized to immobilize the PCBs prior to disposal in the waste management unit. This process would be implemented on PCB impacted soils to reduce the potential for leaching, and thereby reducing mobility and bioavailability.

The disposal cell cover would be designed with a cover system would consist of a single layer of 60-mil HDPE, surface water collection and removal system, and a four-foot thick vegetative cover soil layer. The thickness of the vegetative cover is related to the severity of storms that pass through the area. Alternatively, the vegetative cover could be replaced with a reinforced concrete cover to provide additional protection.

Alternative 3A: On-Site Treatment by Thermal Blanket and Thermal Oxidation

Estimated Capital Costs: \$18,564,800
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: \$18,564,800
Estimated Time Frame: 4 months
Estimated Time to Remedial Action Objectives: 10 months

The thermal blanket process has been used previously in the United States. This technology was also used for the Phase II Removal Action in 1998-99. The ex-situ thermal desorption system is modular and consists of 32 thermal panels, a vapor treatment system (VTS), power trailer, and control trailer. The power supplied to heating elements below the soil raises the temperature of the soil to a target temperature of 750°F, and is maintained for a minimum of 24 hours, the time expected for the PCBs to be completely volatilized from the soil.

Contaminant vapors are withdrawn from the soil by a vacuum system that feeds a trailer-mounted VTS to oxidize residual PCBs, discharging carbon dioxide and water vapor into the atmosphere. The VTS consists of a flameless thermal oxidizer and a GAC filter. The GAC adsorbs the vaporized contaminants not destroyed by oxidation.

Alternative 3B: On-Site Treatment by Incineration

Estimated Capital Costs: \$7,830,700
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: \$7,830,700
Estimated Time Frame: 6 months
Estimated Time to Remedial Action Objectives: 10 months

In this alternative, soil treatment is accomplished by incineration, which is a technique that utilizes high temperatures to volatilize and thermodynamically break down contaminants to non-hazardous components. The incineration process typically proceeds in two stages. First, the contaminated soil is introduced into a directly fired rotary kiln, operating at 1000 F, which partially destroys the PCBs and other organic materials. Vapors from the kiln are then introduced into a secondary combustion chamber at approximately 2000 F for complete destruction of the PCBs and other organic materials. The incineration phase oxidizes the hazardous waste to non-hazardous compounds, principally water and carbon dioxide. Often, this phase produces some acid gas, which is scrubbed or removed by other means.

The incineration system is portable and can be set up at remote sites. It primarily requires only fuel, water, and power for operation. The incinerator can be configured to meet the required treatment standards for the site (1-ppm PCBs in soil). However, incinerators are required to meet stringent emission standards for offgas treatment. This generally results in high mobilization costs associated with the demonstration of compliance with regulatory emission standards.

Alternative 4A: On-Site Treatment by Indirect Thermal Desorption and PCB Destruction by Fenton's Reaction

Estimated Capital Costs: \$6,895,700
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: \$6,895,700

Estimated Time Frame: 6 to 8 months
Estimated Time to Achieve Remedial Action Objectives: 12 months

This alternative involves the process of indirect thermal desorption (ITD) as the method of soil treatment, followed by the Fenton's Reaction for destruction of PCBs from the resulting residue (see Figure 2). ITD has been successfully utilized for 15 years for effectively extracting from soil a variety of wastes, including PCBs. ITD by itself is a separation process intended to concentrate wastes for further treatment by other processes. The ITD is a continuous process that uses a thermally efficient rotary dryer that effectively removes the PCBs from the contaminated soil.

The contaminated soil and debris are crushed and screened to minus 2 inches and passed through the dryer. The feeder is operated with a variable-speed drive and allows plant operators to vary the feed rate. A heat source (fuel oil-fired burner) transfers heat through a metal shell to the soil as it contacts the metal. Material is processed in a triple dryer that is indirectly heated with a flame source. The material can be heated to temperatures as high as 1000°F, which completely volatizes the PCBs. The rotary dryer treats the soil rapidly (usually in 30 minutes). The triple dryer has demonstrated treatment rates in excess of 20 tons per hour on material contaminated with PCBs.

The PCB contaminant residue from the ITD can be treated by the Fenton's Reaction to destroy the PCBs. Fenton's Reaction occurs in a water slurry mixture of contaminants and solids. The batch process undergoes a pH adjustment in one vessel followed by iron and peroxide addition in another. All reactions are done in a water slurry mixture at about 110°F. The residual peroxide is consumed in chemical oxidation of the waste and decomposed to water and oxygen. The effectiveness of this process has not been proven on actual ITD residuals from Tanapag. Laboratory and pilot scale testing must be done to demonstrate destruction of the PCBs contained in the ITD residuals to less than 1.0 ppm before this process can be used.

Alternative 4B: On-Site Treatment by ITD and PCB Destruction by Solvated Electron Technology

Estimated Capital Costs: $7,632,700
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: $7,632,700
Estimated Time Frame: 15 months
Estimated Time to Achieve Remedial Action Objectives: 20 months

Alternative 4B begins with initial treatment and separation by ITD (Alternative 4A). In this alternative post-treatment of the ITD residuals is PCB destruction by Solvated Electron Technology (SET™). To couple the two processes, a low temperature dryer unit would also be required prior to treatment by the SET™ unit.

The treatment process begins by placing the ITD residual contaminated material into the reactor vessel. When the conductivity in the vessel drops to a predetermined level, feed is stopped. The destruction is very fast and is essentially diffusion controlled. The feed rate is typically less than a ton of material per day. The treated material is discharged to a waste storage vessel and then adding a solution of ammonia and metallic sodium, calcium, potassium, or lithium. At this point, the treated material may be removed; pH adjusted, and disposed as non-hazardous material.

After the reaction in the reactor vessel is complete, the solution is transferred to the separator tank using the natural pressure of the ammonia as the motive force. In the separator vessel, the ammonia is heated to approximately 125°F, and is pumped in vapor form to a condenser for recycling.

The effectiveness of this process has not been proven on actual ITD residuals from Tanapag. Laboratory and pilot scale testing must be done to demonstrate destruction of the PCBs contained in the ITD residuals to less than 1.0 ppm before this process can be used.

Alternative 4C: On-Site Treatment by ITD and PCB Destruction by Gas-Phase Chemical Reduction

Estimated Capital Costs: $9,480,700
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: $9,480,700
Estimated Time Frame: 6 to 8 months
Estimated Time to Achieve Remedial Action Objectives: 12 months

This alternative is coupled initially with treatment and separation by ITD. The PCBs in the condensate from the ITD component are destroyed by the Gas Phase Chemical Reduction (GPCR) process. The GPCR unit has a front-end batch ITD unit to vaporize the PCBs before destruction by the GPCR process (see Figure 4). To couple the two processes, a low temperature dryer will drive off the soil moisture before GPCR treatment.

The contaminant separation is done in a batch processor where the organic compounds are desorbed before being fed into the reactor where steam is used in the reactor for heat transfer. Organic compounds are ultimately reduced to methane, hydrogen chloride, and minor amounts of hydrocarbons by hydrogen at high temperature.

Gas leaving the process reactor unit is scrubbed to remove acids, water, fine particulate matter, aromatic compounds, and carbon dioxide. Some of the cooled and scrubbed product gas is reheated and circulated back into the reactor. The excess gas is removed from the system, compressed, and stored. The stored gas is continually analyzed and subsequently used as fuel to heat the boiler or burnt off.

The effectiveness of this process has not been proven on actual ITD residuals from Tanapag. Laboratory and pilot scale testing must be done to demonstrate destruction of the PCBs contained in the ITD residuals to less than 1.0 ppm before this process can be used.

Alternative 4D: On-Site Treatment by ITD and PCB Destruction by Base-Catalyzed Dechloronation

Estimated Capital Costs: $10,184,700
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: $10,184,700
Estimated Time Frame: 12 to 18 months
***Estimated Time to Achieve Remedial Action Objectives:* 24 months**

The treatment method for this alternative is composed of the continuous-feed ITD technology, followed by Base-Catalyzed Dechloronation (BCD). The BCD batch process is coupled to the ITD; the PCBs concentrated in the condensate and solids by the ITD are destroyed in the BCD unit (see Figure 5). A strong base material (typically sodium hydroxide with a pH less than 7) is blended with a catalyst and organic waste and heated under pressure for a few minutes, which causes chlorine to be replaced with hydrogen. The end product is an organic oil material that contains no PCBs.

Since the ITD uses a condenser to capture the organic waste, the condensate is a mixture of water, contaminants, and particulate matter. In removing the water, the waste is typically bound to the solids. Sacrificial oil such as nonane or bunker oil is mixed with the solids at ratio of 15 % oil to solids, and the slurry is fed into the batch BCD reactor for treatment. The resultant is an asphalt mixture with generally low concentrations of PCBs.

The effectiveness of this process has not been proven on actual ITD residuals from Tanapag. Laboratory and pilot scale testing must be done to demonstrate destruction of the PCBs contained in the ITD residuals to less than 1.0 ppm before this process can be used.

Alternative 4E: On-Site Treatment by ITD and Off-Site Disposal

Estimated Capital Costs: $6,764,100
Estimated Annual Operations and Maintenance Costs (O&M): None
Estimated Present Worth: $6,764,100
Estimated Time Frame: 6 months
Estimated Time to Achieve Remedial Action Objectives: 11 months

This alternative uses Indirect Thermal Desorption of approximately 20,000 tons of PCB contaminated soils. Approximately 400 tons of PCB contaminated residuals from the ITD process will be shipped off the island. In this alternative, the contaminated residuals would be packaged in DOT-rated containers or sacks, typically with a rated capacity of 1-1½ cubic yards. The individual sacks would be loaded into 20-foot shipping containers and transported by ocean carrier to the U.S. mainland for disposal in an appropriate disposal facility. Approximately 19,800 tons of ITD treated soils containing less than 1.0 ppm PCBs will be used for fill material on Saipan.

2.10 COMPARITIVE ANALYSIS OF ALTERNATIVES

Ten remedial alternatives were evaluated for suitability for the Phase III Tanapag Village Removal Action. These ten remedial alternatives were individually compared with each of the nine evaluation criteria to determine which of the alternatives met all nine of the criteria.

The alternatives, which satisfy the nine criteria, are compared to evaluate the relative merits and deficiencies of each alternative relative to one another so that they can be ranked in terms of the various evaluation criteria. The detailed discussion and analysis concerning the alternatives are in the FFS.

EVALUATION CRITERIA FOR REMEDIAL ALTERNATIVES
Overall Protection of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment.
Compliance with ARARs evaluates whether the alternative meets Federal and State environmental statues and regulations that pertain to the hazardous substance to be remediated at the site, or whether a waiver is justified. The ARAR designated for this site is: ***Toxic Substances Control Act (TSCA) (15 United States Code (USC) Section 2605), & 40 Code of Federal Regulations (CFR) Section 761.61-PCB Remediation Waste and other appropriate sections.***
Long-term Effectiveness and Performance considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Costs include estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Costs estimates are expected to be accurate within the range of +50 to –30 percent.
CNMI Acceptance considers the comments of the CNMI on the Corps' analyses and recommendations, as described in the FFS and Proposed Plan.
Community Acceptance considers comments of the local community and any other members of the public on the Corps' analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

The FFS evaluated each of the ten alternatives against the nine criteria described in this section. The first two criteria are categorized as "Threshold Criteria" that each alternative must meet to be eligible for further evaluation. The third through seventh criteria are used to develop the proposed plan. However, the final decision on the selection of the remedy will be made only after full consideration of the final two criteria, through review and response to the CNMI DEQ and all public comments received on the proposed plan. The results of that evaluation are summarized here.

Alternative 1: No Action

This alternative was retained for comparative analysis as required by the National Contingency Plan (NCP). However this alternative does not meet the threshold criteria, overall protection of human health and the environment. This alternative fails to meet the criteria because the PCB contaminated soils would remain in temporary storage. The temporary cells are not engineered containment systems, thereby presenting a long-term threat to human health and the environment. The PCB contaminated soils were placed in temporary storage cells pending future treatment and disposal. While the temporary storage cells are adequate for the immediate future they do not meet the standards that a permanent TSCA-approved disposal facility is required to meet.

Alternative 2A: Off-Site Disposal
This alternative meets all seven of the criteria evaluated to date and was retained for comparative analysis.

Alternative 2B: Off-Site Encapsulation
This alternative meets all seven of the criteria evaluated to date and was retained for comparative analysis.

Alternative 3A: On-Site Treatment by Thermal Blanket
This alternative has been utilized in the past in Tanapag. Past experience with this alternative suggests that the process may have a difficult time meeting the 1.0 ppm treatment standard imposed by EPA, without the need to retreat soils. Excessive re-treatment of soils has the potential to dramatically increase the time required to complete remediation of the stockpiled soils. This alternative was not retained for comparative analysis because it may not satisfy the criteria to reduce toxicity and may not meet the criteria for short-term effectiveness because of the time required to complete the project if multiple treatment of the soils is required.

Alternative 3B: On-Site Treatment by Incineration
This alternative meets all seven of the criteria evaluated to date and was retained for comparative analysis.

Alternative 4A: On-Site Treatment by Indirect Thermal Desorption and PCB Destruction by Fenton's Reaction
Article VIII, Section 1.B, of the Final Administrative Order, dated December 20, 2000, specifies that the treatment methodology proposed in this alternative must comply with relevant regulatory requirements and be approved by USEPA. USEPA approval will be contingent upon a testing and demonstration phase for the thermal desorption process to confirm that the thermal desorption unit meets all relevant regulatory requirements. This Article further requires that USACE perform laboratory-scale investigations of the feasibility and practicability of using Fenton's Reaction. Bench tests of the Fenton's Reaction process are being performed on site materials to verify the implementability of the process and process rates; however, to date this process has not been demonstrated to be capable of achieving the 1.0 ppm treatment standard for the subject contaminant residue.

The implementability of the second phase of this two step process has not been demonstrated. Therefore this alternative was not retained for comparative analysis because it does not meet the implementability criteria.

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Alternative 4B: On-Site Treatment by Indirect Thermal Desorption and PCB Destruction by Solvated Electron Technology
Article VIII, Section 1.B of the Final Administrative Order, dated December 20, 2000, specifies that the treatment methodology proposed in this alternative must comply with relevant regulatory requirements and be approved by USEPA. USEPA approval is contingent upon field pilot testing that demonstrates that the treatment method is capable of destroying PCBs to less than 1.0 ppm.

The implementability of the second phase of this two step process has not been demonstrated. This alternative was not retained for comparative analysis because it does not meet the implementability criteria.

Alternative 4C: On-Site Treatment by Indirect Thermal Desorption and PCB Destruction by Gas-Phase Chemical Reduction
Article VIII, Section 1.B of the Final Administrative Order, dated December 20, 2000, specifies that the treatment methodology proposed in this alternative must comply with relevant regulatory requirements and be approved by USEPA. USEPA approval is contingent upon field pilot testing that demonstrates that the treatment method is capable of destroying PCBs to less than 1.0 ppm. The second phase of this two-phase process has only been demonstrated to be effective on PCB dielectric fluids. This alternative was not retained for comparative analysis because it does not meet the implementability criteria.

Alternative 4D: On-Site Treatment by ITD and PCB Destruction by Base-Catalyzed Dechloronation
This alternative is not protective of human health and the environment. Since the Base-Catalyzed Dechloronation process is not capable of destroying PCBs in the ITD residue to meet 1.0-ppm treatment standard.

Article VIII, Section 1.B of the Final Administrative Order, dated December 20, 2000, requires that the excavated soils and contaminated debris be treated by a USEPA-approved methodology that is capable of removing PCBs to less than 1.0 ppm. This process is not capable of destroying PCBs to the level specified in the Final Administrative Order.

This alternative was not retained because it does not meet the protection of human health and the environment criteria and it does not meet the implementability criteria.

Alternative 4E: On-Site Treatment by ITD and Off-Site Disposal
This alternative meets all of the seven criteria evaluated to date and was retained for comparative analysis

COMPARATIVE ANALYSIS OF RETAINED ALTERNATIVES

Overall Protection of Human Health and the Environment
Alternative 1 (No Action) does not meet the threshold criterion of being protective of human health environment. Alternatives 2A (Off-Site Disposal), 2B (Off-Site Encapsulation), 3B (On-Site Incineration), and 4E (On-Site ITD/ Off-Site Disposal) meet this threshold criterion.

Compliance with ARARs
All of the alternatives comply with the threshold criterion of meeting the ARARs. Alternative 1 does not meet the requirements of the EPA Order, which specifies that soils left in unrestricted areas must not contain PCBs in excess of 1.0 ppm.

Long-term Effectiveness and Permanence
Alternative 1 (No Action) retains PCB contaminated soil in temporary stockpiles for an indefinite period of time. Long-term storage under temporary storage conditions presents a long-term threat to human health and the environment in Tanapag. Alternative 2A (Off-Site Disposal)

permanently removes PCBs from Tanapag. Alternative 2B (Off-Site Encapsulation) will permanently contain the PCBs. Alternative 4E (On-Site ITD/ Off-Site Disposal) is not a destruction remedy, however the PCBs are effectively and permanently removed from Tanapag. Alternative 3B (On-Site Incineration) destroys PCBs (see discussion under Reduction of Toxicity, Mobility, or Volume criterion), thus making this alternative rank very high under this criterion.

Reduction of Toxicity, Mobility, or Volume

Alternative 1 (No Action) does not meet this criteria. Alternative 3B (On-Site Incineration) permanently destroys PCBs and achieves all 3 of these goals. Alternative 2A (Off-Site Disposal) only meets the goal of reduction of mobility by placing the contaminated soil in a controlled disposal facility. Alternative 4E (On-Site ITD/ Off-Site Disposal) effectively reduces the toxicity, mobility, and volume of contaminated soil at the sites. Alternative 2B (Off-Site Encapsulation) only reduces mobility. If the contents within the waste management unit are solidified or stabilized, the volume will increase by 5 to 10 percent.

Short-term Effectiveness

Alternatives 1 (No Action) is most protective for site workers and eliminates the risks to the community related to implementing an alternative that involves moving the contaminated materials or using heavy equipment. Alternatives 2A (Off –Site Disposal), 2B (Off-Site Encapsulation) Alternative 3B (On-Site Incineration) and 4E (On-Site ITD/Off-Site Disposal) are essentially equally protective of site workers and the community. The hazards associated with moving, treating and loading contaminated soils are manageable through the application of appropriate work plan controls and monitoring.

Alternative 1 (No Action) is immediately effective because it has been completed. Alternative 2A (Off-Site Disposal) will require 10 months to be effective. The 10 months is the estimated time necessary to ship 1000 containers of contaminated soil to Guam for eventual shipment to the United States. Alternative 2B (Off-Site Encapsulation) can be effective within 2 to 3 months if a suitable site can be located on site where no permit is required from the CNMI. If a permit is required, the time for Alternative 2B (Off-Site Encapsulation) to be effective will be 2 years or more. Alternative 3B (On-Site Incineration) will require 10 months to be effective. Alternative 4E (On-Site ITD/ Off-Site Disposal) can be effective in 9 months, depending on shipping schedules for the 400 tons of ITD residuals that will be shipped off of Saipan.

Implementability

Alternative 1 (No Action) is the most easily implementable alternative because it is essentially complete.

Alternative 2A (Off-Site Disposal) is technically, easily implementable. However, shipping constraints decrease the overall implementability rating. In evaluating the implementability of this alternative, it was assumed that 4 containers per day could be loaded. Containers are shipped by barge from Saipan to Guam at the rate of 24 per week. The rate at which containers can be shipped from Saipan to Guam is limited by barge capacity and potentially by the number of seaworthy containers available in Saipan. Cargo ship service to the West Coast of the United States is monthly. The ships in transit from Guam to the United States should be able to carry 100 + containers per month. Given these assumptions 10 months would be required to complete this alternative.

Alternative 2B (Off-Site Encapsulation) is readily implementable subject to the location of a suitable site for the encapsulation cell on the site where a permit from the CNMI would not be required. Potential permit requirements would reduce the implementability rating. The use of a standard design for the waste management unit shortens the design and specification phase of this alternative. The HDPE liner is readily available, but will require a skilled installation team from the mainland construct. All other aspects of the construction are available on Saipan.

Alternative 4E (On-Site ITD/Off-Site Disposal) is technically implementable. ITD is a proven technology that will be capable of treating the soils in Tanapag. Because the ITD process is continuous, the duration of the soil processing with this unit is anticipated to be relatively brief. The unit proposed for use at Tanapag is a modular unit designed for containerized transportation aboard ship.

Alternative 3B (On-Site Incineration) can be completed in less than a year if a suitable incineration unit is available off the shelf. If a custom designed incinerator is required, the design construction and performance testing of the unit will be time consuming.

Cost
The most cost-effective alternatives are Alternative 1 (No Action). Alternative 2B (Off-Site Encapsulation) at $1,039,500 and $1,499,300 respectively.

Alternative 3B (On-Site Incineration) and Alternative 4E (On-Site ITD/Off-Site Disposal) have costs in the mid-range at $7,830,680 and $6,764,120, respectively.

The most costly is Alternative 2A (Off-site Disposal) at $18,456,900.

CNMI Acceptance
The comments of the CNMI Department of Environmental Quality (DEQ) on the Proposed Plan are included in the Responsiveness Summary at the end of this document, along with the USACE responses to the comments. A number of questions and concerns were raised by the CNMI DEQ, however they expressed general support for the proposed remedial action, as long as the cleanup levels are achieved and protection of public health and the environment is assured.

Community Acceptance
Comments were submitted from members of the public both in writing and in remarks or questions at the public meeting on July 11, 2001 at Tanapag. The comments are all included in the Responsiveness Summary at the end of this document. Some member of the public preferred the alternative of off island disposal of all the stockpiled materials. Some others expressed support for the remedy of ITD treatment followed by off island disposal of the contaminated treatment residuals. The responses of USACE to all the public comments are included in the Responsiveness Summary.

2.11 SELECTED REMEDY

Treatment of the contaminated soils with IDT technology followed by shipment of the residuals off island is the best remedy available. It minimizes shipping problems, which would probably be insurmountable, if the shipment of 20,000 tons alternative was attempted. It satisfies the statutory preference for treatment of the contaminated material. It is more acceptable to the community and the USEPA than incineration. It is a demonstrated technology that is proven to be effective; it is not an experimental technology, which was also unacceptable to the community.

2.11.1 SUMMARY OF RATIONALE

Several factors were considered in the selection of Alternative 4E (On-Site ITD / Off-Site Disposal) as the remedial alternative for the site. The discussion below summarizes the approach that resulted in selection of Alternative 4E.

Certain alternatives were excluded from comparison because they did not meet basic criteria for successful remediation of the site. Alternative 3A was excluded from comparative analyses, because it failed to reduce the toxicity of soils in a reasonable amount of time, requiring multiple applications of the same process. Similarly, Alternatives 4A – 4D were also excluded from comparative analyses due to questions about their effectiveness on the particular soil matrix requiring treatment. Significant time and effort would be required to conduct bench and pilot studies to determine the effectiveness in reducing the level of contamination to <1 ppm.

Of the remaining choices, Alternative 1 could not be considered a viable alternative, because it was a temporary measure, merely storing contamination on site in lieu of comprehensive remediation.

This left four viable alternatives – Off-Site Disposal (2A), Off-Site Encapsulation (2B), On-Site Treatment by Incineration (3B), and On-Site ITD / Off-Site Disposal (4E). These four alternatives were evaluated against the selection criteria. Concerning five of the selection criteria, the four remedial alternatives were effectively even relative to one another. The five criteria were:

- Overall protection of human health and the environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- CNMI Acceptance
- Community Acceptance

Regarding the remaining selection criteria, the strengths and weaknesses of each alternative, relative the selected alternative, are discussed below.

Off-site Disposal (2A) vs. On-site ITD/Off-site Disposal (4E)

Although off-site disposal reduces the mobility of the contaminants, it does not reduce the toxicity or volume of the contaminated medium. Furthermore, this alternative would be the most expensive to implement. Therefore, on-site ITD/off-site disposal is considered more highly effective and lower in costs than off-site disposal alone.

Off-site Encapsulation (2B) vs. On-Site ITD/Off-site Disposal (4E)

As in off-site disposal, off-site encapsulation only reduces the mobility of contaminants, without addressing toxicity or volume. Furthermore, although off-site encapsulation is significantly less expensive than on-site ITD/off-site disposal, questions about implementability hinder the encapsulation approach somewhat. It is unclear whether a suitable site could be found in which a treatment permit would not be necessary. If a permit were sought, the process could impact the remediation timetable. Conversely, on-site ITD/off-site disposal is implementable under a clearly defined timeframe, with a distinct reduction in contaminant mobility, toxicity and volume. For these reasons, on-site ITD/off-site disposal was selected over off-site encapsulation.

On-site Incineration (3B) vs. On-site ITD/Off-site Disposal (4E)

Both alternatives effectively reduce toxicity, mobility and volume of contaminants, and both would employ similar strategies for the protection of site workers and the community. Although on-site incineration is cheaper, this advantage is negated by the logistical challenges involved with finding a suitable unit for the site. Conversely, the ITD unit is implementable now. Therefore, on-site ITD/off-site disposal was selected over on-site incineration.

2.11.2 DESCRIPTION OF THE SELECTED REMEDY

ECC Clean™ is an in-directly heated thermal desorption system (ITD), a class of low temperature thermal desorption system, for removing PCB contaminants from soil without combustion or burning. Indirect heating assures that burning of wastes does not occur. The desorption process heats the soil in a dryer and boils contaminants off soil particles rendering soil clean. The treated soil meets the residential reuse standard for fill. The contaminants in vapor form are removed from the dryer and are further refined to a small solid PCB waste stream. This waste can be safely shipped to a processing facility for disposal.

Soils treated with ITD will be free of PCB and be available for unrestricted reuse (residential standards). The soils can be amended to support re-vegetation. Upon completion of the process the equipment and supplies will be removed and the site graded for reuse.

Process Details

The key component to boiling the contaminants from the soil is a triple dryer. The dryer is a variable-speed rotary unit indirectly heated with a 30 MBTU/hr flame source (fuel oil for Saipan). Heat is transferred into two concentric cylindrical alloy chambers and to the exterior of the third cylinder. The triple dryer has demonstrated treatment rates in excess of 20 tons per hour. The design of the unit features enhanced heat transfer to optimize thermal efficiency. Soil is discharged at approximately 900 degrees F. Bench testing of Tanapag soils has demonstrated complete removal of PCBs at temperatures below 900 degrees F. The dryer is maintained under vacuum in an inert (<4% Oxygen) atmosphere to assure no burning during the desorption phase.

Material feed systems consist of conventional feed screening plants and conveyors for soil preparation. Soil exiting the dryer passes through a double tipping valve, and is then conditioned with water in an auger. This conditioning reintroduces moisture into the soil for re-hydration.

Vapors from the dryer consist of steam (water within the soil), contaminants and particulate matter. Air quality is preserved through treatment, separation and reuse, with such techniques as steam collapse, particulate scrubbing and condensation of organic vapors. Over 20 MBTU/hour of cooling capacity is supplied on a cooling skid. Off-gasses are sub-cooled (using a chiller), and pass through vapor phase carbon polishing system and HEPA particulate filter. Oils, PCBs, and solids-condensed water are removed by coagulation, separation and filtration. Solids are collected and placed in containers for off-island disposal. Water is polished prior to use to re-hydrate treated soils. The conditioned vapors are verified free of pollutants and then recycled to the dryer burners for treatment and disposal. Steam and dust resulting from cooling the treated soil is filtered through a particulate collector (bag-house) prior to reuse for seal purge.

Full system instrumentation includes programmable logic controls. Man-machine interface software provides operation and remote monitoring and data logging capabilities. An Automatic Waste Feed Shut Off (AWFSO) system protects against non-compliant conditions. A Continuous Emission Monitor (CEM) monitors oxygen concentration; other process variables are monitored and measured as required pursuant to permit conditions. An emergency cooling system assures steam/organic removal upon power outage or failure of other system components.

The ITD system consists of ten 40-foot ocean containers stacked to occupy an area of 66 feet by 61 feet. The system setup time is two weeks. Visible signs of operation include a cooling tower steam plume and a heat plume from the stack. Utility needs are water, fuel and electricity. The system will be operational 24 hours a day with a small crew.

ITD System Schedule

From initial equipment mobilization through demobilization, the ITD operations will be approximately 6 months. The Phase IV ITD Treatment Schedule has the following major milestones: mobilization, startup, demonstration test, interim operation, full-scale production, and demobilization. Note that closure report preparation, review, revision and acceptance is anticipated to extend the overall project schedule an additional five months beyond demobilization, for a total of 11 months to complete the project.

After ECC receives NTP for field mobilization, construction of the temporary facilities will begin, including excavation activities to allow construction of the treatment area pad (concrete curbed area). All ITD utilities will be installed during this phase. Underground utilities are preferred to maximize use of the treatment pad. ECC will also develop an on-site office complex to support the operations.

Concurrently, the ITD unit will be shipped to the site from Indio, California via the port of Los Angeles. The shipping duration is expected to last 3. One final container will follow one month later, which will contain spare parts and materials for the operation (initial shipment will include a minimum of two months supply). ECC plans on shipping one container per month with supplies and reagents to sustain operations while minimizing excess hazardous materials storage. This will also allow for variations in operation rates and material needs.

Upon receipt at the site, ECC will start setting up the ITD system. As the process equipment erection nears completion (approximately two weeks), motors pumps, control loops, and associated equipment will be bumped and functionally tested. Clean soil will be processed through the unit to assure the system has been installed correctly and to verify the functionality of the equipment under loaded conditions. All automatic waste feed shut-offs (AWFSOs) will be tested prior to introducing contaminated material into the system. Contaminated soil will not be introduced until a reliability run has been performed. The reliability run shall demonstrate operation of the equipment for 23 hours out of 24 hours available.

ITD interim operation is scheduled to start immediately after shakedown testing is complete. During interim operations, ECC will optimize the ITD process and prepare for the demonstration test. ECC expects a maximum of 850 cubic yards contaminated soil will be processed during the interim operating period, including the demonstration test. During interim operations a mini test for PCB’s will validate the performance of the air pollution controls systems. This mini test is described in detail in subsequent sections.

The demonstration test is scheduled over a two to three day period. Twenty to thirty days after completion, ECC will submit the demonstration test report.

While awaiting results the regulatory agency reviews of the test, ECC will operate the system at 75% of the design conditions tested during the demonstration test. ECC will continue to operate at this reduced rate until the results have been submitted and validated to meet the emission expectations set forth in this plan.

ITD full-scale operations will begin after regulatory (EPA) approval of the test report is complete.

After all contaminated stockpiled material has been treated through the process; ITD demobilization activities are scheduled to begin. The ITD demobilization activities are expected to take three weeks. The treatment area pad will scrubbed and remain for further site development.

Island Logistics

ECC has ascertained that sufficient utilities are available through existing infrastructure to operate the ITD system. Fuel delivery will be completed by two fuel oil suppliers on island at 250 gallon per hour. Fuel will be stored in two existing fuel oil storage tanks near the site. The storage capacity will allow for 60 hours of operation.

Electrical needs are 0.75 mega-watts (MW) at peak use. This demand has been discussed with the power producer and can be met for the phase of the project. A stand-by generator will be included with the equipment to meet emergency needs including safe shut down of the equipment.

Suitable water supply in available in the village. ECC may boost the water pressure to meet minimum pressure needs of the ITD.

Equipment suppliers are available. This includes crane service, earth moving equipment, a telescoping forklift and miscellaneous equipment for preparing the site.

Material suppliers are available, including an assessment of local stock of hardware items, electrical components and steel and welding supplies. ECC understands the limitations of these suppliers and has planned to fill key parameters with an inventory of spare parts and materials. This includes special stainless steel welding rods, stainless steel stock, large size fasteners, gasket material, insulation and special tools. The ITD is equipped with hand tools for servicing the equipment, three welding machines, and pipe threading equipment, lights and saws. Electrical supplies include spare motors, gear reducers, motor controls, instruments, fuses and wire.

Materials used in the process including diatomaceous earth, sulfuric or phosphoric acid, biocide, water conditioner and polymer are planned to meet production. A start up supply will be shipped from California with the equipment. On going needs will be met from worldwide suppliers who have ship points in Japan, Australia, Philippines or the US.

ECC will use island contractors to the maximum extent for support to maintain, erect and ship the equipment. On island resources include machinists, electricians, welders, concrete installers, plumbers, security service etc.

ECC has identified an adequate work force from on island labor pool to support the work. It is anticipated that 15- 20 local laborers, both skilled and unskilled, will be required. The thermal system requires 8 fully trained specialists from the US to supplement the local labor support. Adequate housing of ITD specialist personnel is available on island.

Shipping Options

The ITD has been specifically assembled to meet shipping constraints for ease of transportation. The system can be transported by ship, rail or truck. Shipment of liquid reagents will be by drum in containers. Shipment of solids (diatomaceous earth) will be by pallet in a container. All shipment will follow shipping regulations including marking and hazardous separations.

Site Preparation and Utility Requirements

The unit will be transported to the job site for assembly by a nominal 50-ton hydraulic crane and an extendable forklift. The site must be prepared by leveling and constructing a concrete base with a load bearing capacity of 5,000 pounds per square foot.

A concrete pad (100 ft by 150 ft) will be the base for all processing equipment, the feed preparation area, decontamination pad, and treated soil storage area. The utility requirements for the system include makeup water, electricity, fuel oil and specialty gases for the oxygen analyzers. The utility requirements are summarized in Table 1 and are described in detail below.

Table 1

ITD Utilities

ITEM	DESCRIPTION
Electric Power	460 volt, 3-phase, 60 cycle, 800 amp
Raw water makeup	150 gpm capacity @ 40 psi
Fuel Oil	35 MM BTU/hr (260 gph)
Liquid propane	100 gallon storage tank for pilot valves
Cylinder gas	2% O_2 in N_2 , and 8% O_2 in N_2 calibration gases Nitrogen : Zero 0.2 grade calibration gas

Brackish water supply available from the fire hydrant adjacent to the site has been verified as acceptable for the process use. The water pressure will be enhanced as required to meet the supply water pressure needs for the cooling tower.

Power supply will be derived from the high voltage line adjacent to the site, which was used during previous treatment activities. A one-MVA transformer will be connected to the high voltage line and equipped with an 800-Amp disconnect breaker for the ITD unit. Reliable power has been addressed in the design and ECC will utilize an emergency generator to shut the system down in the event of a power failure.

Two six thousand-gallon fuel oil tanks will be installed to store fuel oil. The storage tank will be installed in accordance with Federal Spill Prevention Controls and Countermeasures regulations that, at a minimum, include secondary containment and top mounted fuel piping. The tank will be located away from buildings and equipment in accordance with local code requirements.

Compressed gas cylinders of standard grade calibration gases are required. Additional calibration gases will be utilized for handheld instruments for volatile organic compounds (VOCs) and Carbon Monoxide (CO). All calibration gases will be shipped with the equipment from the mainland. Calibration gases will be stored in accordance with OSHA requirements.

The system operates 24 hours a day, 7 days a week except for shutdowns. Three shift operators will provide maintenance, set points, and maintain general control of the system.

ECC predicts soil treatment rates of 14 TPH for Saipan based on soil conditions and previous treatment temperatures used during the thermal blanket technology. Conservative temperature profiles and reduced productivity are planned to maximize passing treatment standards. Since logistic planning may interrupt the flow of soil, ECC plans for 60% availability (actual soil treatment / available hours)

The equipment will be placed on a fiber-reinforced concrete pad curbed to contain spills and storm water. A poured sump and pump station will transfer liquids from the pad sump to the ITD water treatment system for treatment and disposal. Storage for treated and tested surface (rain) water (free of PCBs) is available for re-use and site dust control. The ITD is a zero process water discharge operation.

The control room is situated to allow for monitoring of the site. Special barriers will allow access to the office without requiring donning of PPE. The control trailer will be located in the contamination reduction zone. Operators will exercise a modest level of decontamination prior to each entry. This classification may be changed, depending on level of entries required.

ECC will excavate and place underground electric feeder conduit, gas line, water piping, drain sump and equipment ground connections. After forming the base, ECC will place a continuous pour pad. The equipment has been designed to resist high (typhoon class) winds.

Water disposal consists of water blow down from the cooling tower. ECC predicts blow down rates of up to 11 GPM during equipment operation. This water is non-contact cooling water. It will not come into contact with any waste. All process water is recycled to the soil and does not exit the ITD. A discharge drain will be established to accept this non-contact water discharge and any treated and confirmed excess site or storm water. This discharge will consist of a sump placed outside the concrete area at a shallow depth. The sump design is a French-drain type reintroduction basin. Water disposal will follow requirements of Federal and CNMI regulations that include testing.

Controls and Instrumentation

ECC selected PLC input modules specifically designed for instruments to reduce calibration requirements and improve overall accuracy; they include all temperature measurement and flow transmitters. Thermocouples and thermocouple wire is used between the junction and the PLC input. The PLC input provides analog to digital conversions and cold junction compensation. The digital values are calculated in degree F.

A unique feature of the ECC controls is the use of paddle wheel type flow meters. Paddle wheel flow meters use a Hall effect pickup to rotating magnets. The pickup creates a semi square wave pulse based on velocity in the pipe. The ECC PLC converts the pulse frequency and pipe correction factors to the total volume or flow rate. Since the paddle wheel is permanently lubricated, routine maintenance is not required. Since no flow rates are critical for operation (see control description) data is used for tuning and process monitoring. Failure of paddle wheel is determined by pipe pressure monitoring.

The lead operators are responsible for visual evaluation to the condition of all instruments. During scheduled shut downs the instrument tech will evaluate convenient instruments for signs of corrosion, damage or faulty performance. Spare parts or replacements are stocked for most instruments.

Control System Plan

The ECC control system is modular in design to accommodate different operating conditions, allowing for easy installation and reducing wiring for simplified ITD system installation. The design incorporates five programmable logic controllers for all relay, interlock, shut down, monitoring, and timing and control functions. The PLCs are Koyo, with DL250/DL 240 CPUs, all with networking capability.

To reduce wiring between trailers, ECC uses five control panels. Each control panel contains motor starters for adjacent equipment, a PLC for control, and an operator interface display. The control panels are networked together. A single PLC is the master, and the rest act as slaves to the network. A computer datalogger will be installed in the control room and the engineering office for process monitoring. The computers will also be networked together. The PLC can operate to a safe mode should the network be disconnected.

The push button panel and operator interface display allow an operator full control of the plant at the remote locations. An operator can start and stop motors, monitor process variables (temperatures, flows, pressures) or make adjustments to process (feed rate, draft adjustments, retention time, set points).

Safety is an important design consideration on the plant. Since the indirect process creates a potentially explosive gas, stopping the system is undesirable. Several features are incorporated to protect the workers, equipment and environment. First is a series of pull-cords that will stop conveyors. The exposed conveyors (no guards over idlers) have pull-cords for safety. Actuation of the pull-cord will stop the conveyor and equipment feeding it. Essentially, the activation of a pull cord will latch the interlock. The condition cannot be reset without closing the pull switch and restarting the motors in sequence.

An automatic waste feed shut-off (AWFSO) is a latching relay (soft) required to stop the introduction of waste into the system in the event of a process upset, out of compliance condition or an emergency situation.

All off-gas treatment, water treatment, and soil conditioning equipment continue to process as if under normal operation. A Prolonged AWFSO will yield a complete burner shut down and total plant shut down.

Sampling and Analysis

ITD sampling and analysis to be performed at the Saipan project consists of the following:

- Treated soil will be tested to certify clean up levels have been attained whenever contaminated material is being processed through the system. ECC will collect one spot sample every 50 tons of feed material from the soil conditioner discharge. The sample will be a composite for each 250 tons
- The process oxygen concentrations will be monitored during all phases of ITD operations.
- Regulatory testing will be required during the demonstration test, interim operations, full-scale operations, and decontamination phases of the project.
- Initial performance testing will be required during the demonstration test.
- Operational testing for system maintenance will also be conducted during the demonstration test, interim operations, full-scale operations, and decontamination phases of the project.

Normal Operations

Prior to operation of the ITD system, it is necessary to verify that certain prerequisites to operation have been met. These include verification that the feed has been appropriately conditioned and characterized. In addition, adequate supply of fuel, makeup water, and cylinder gases must be verified as well as adequate storage space for the treated product. Feed materials not meeting the above parameters may not be processed without the approval of the Lead Thermal Operator.

If, at any time, operations or maintenance personnel detect an abnormal operating condition which may result in a condition that may cause damage to the equipment, a total system shut down may be initiated by the lead operator.

The treated soil stockpile has been sized to hold five days worth of treated material which will allow for reasonable turnaround times on the treated soil samples. The treated soil stockpiles will be separated using concrete barriers. ECC shall reprocess retreat and reanalyze soils that do not meet the treatment criteria. All sampling and analysis of the treated soil will be done in compliance with the Sampling and Analysis Plan and the Quality Assurance Project Plan.

Treated soil that has been confirmed to meet the treatment standard will be stockpiled in a common pile. Final disposition of soil will follow the excavation and backfill plan.

An emergency shutdown is a major system upset in which the operator cannot bring the system down using normal procedures or will not be able maintain target operating parameters during the shutdown. In an emergency shutdown, all waste feed is immediately stopped. During an emergency shutdown, the radial stacking conveyor is swung into an empty bin or end dump to segregate solids that may not have been fully treated due to the emergency.

Permit Application

All substantive standards and requirements of applicable environmental laws and regulations will be met. Source test will be conducted in accordance with a submitted source test plan. All test methods for the process source test shall be EPA protocol methods.

Excavation and Staging

Excavation and soil staging will consist of the following tasks:

- Progress and post-excavation survey;
- Sequencing of soil stockpile processing;
- Soil treatment rate;
- Excavation sequencing, operations, and controls; and
- Backfill and compaction

Soil Stockpile Removal Sequence

Contaminated-soil will be removed from the soil-holding cells on an 8-hour-day, 7 day-per-week schedule. The rate of removal from the soil-holding cells will be higher than the rate of soil treatment through the thermal treatment unit, so that the schedule of soil removal will accommodate the 24-hour-per-day, 7-day-per-week schedule of thermal treatment.

The screening plant and the crushing plant will be set up in the Processing Area. Berms of clean coral fill will be maintained and reconfigured as required to contain and separate contaminated work areas from clean areas during all Phase IV processing and treatment activities.

Material Handling

There are three types of materials in the eleven holding cells (Cell # 1 is the Structure and is empty); type one is a combination of coral, sand and clay soils; type two is concrete debris and type three is green waste. Type one material is approximately 90% for the total volume, type two is 8% and type three is 2%.

Soil and concrete debris in the storage cells must be separated, screened and sized to two-inch minus prior to thermal treatment. Green waste will be separated and processed through a tub grinder resulting in a mulch type product. Once contaminated soil has been screened and crushed to 2-inch minus, processed materials will then be temporarily stockpiled in the Structure (Omni™ pre-fabricated, temporary tent), which is located over soil-holding cell 1. Contaminated-soil will be transported from the Omni structure to the treatment unit as required with a rubber-tired front-end-loader. Weight of material entering the ITD is measured on a belt scale.

A portable jaw crusher will be mobilized to the site. The crusher will crush the oversize rock and concrete to less than 1.5 inches in size (two-inch nominal). Subsequently, the fine material will be sent through the ITD unit for treatment.

A clean rubber-tired loader will be utilized outside the soil processing area to transport the treated soil from the treated soil stockpile to area designated in Cemetery 2 for clean soil placement.

In summary, ECC plans to reduce the size of all rock material by crushing and screening methods and treat the rock material in the ITD unit. After this treatment, the material will be well blended with the treated soil and returned to the excavation as clean, treated fill material.

Scrap Metal

During excavation operations, scrap metal may be encountered. The metal material will be screened from material entering the ITD unit for treatment. Scrap metal will be segregated and decontaminated with a surfactant and rinsed with a high-pressure washer.

Backfill and Compaction

Backfilling will not begin until excavation or construction below finished grade is approved; underground utilities systems are inspected, tested and approved; any forms used removed; and the excavation is free of trash and debris. After remediation activities are completed at each excavation, as-built surveys are completed, and authorization has been received from the CO, backfilling operations will commence.

The source of backfill material will be the excavated material that was treated by the ITD unit. The excavated material will only be used as backfill material after the material is treated at the ITD unit and the results are verified by post treatment confirmatory sampling analysis.

Treated excavation material used for backfill will be stored at the treated material temporary stockpile areas in clean areas adjacent to the ITD unit or stockpiled separately if it cannot be readily placed as backfill. The material will be stored on top of a 10 mil thick sheet of plastic stretched across the material laydown area and separated by berms from contaminated areas at the site.

Fill material will not contain scrap metal, wood, concrete, asphalt, or other man-made materials larger than two-inch.

Backfill and Consolidation

The backfilling operations for a specific excavation area will lag behind the actual excavation and treatment tasks and may actually be performed at the end of the project field activities. This is dependent on the confirmation sampling turn-around time, verification results, and the time necessary to treat contaminated soil.

Site Restoration

Upon completion of excavation backfilling, he site will be graded to pre-work conditions and all disturbed areas will be seeded. Prior to seeding, any previously prepared seedbed areas compacted or damaged by interim rain, traffic, or other causes, will be reworked to restore the ground condition.

All remaining waste material will be removed during site restoration activities and disposed off-site. Adjacent paved areas will be cleaned. Temporary safety fencing will be removed at the completion of work.

Traffic, Transportation and Off-site Disposal

This section addresses the tasks proposed for both the ongoing site maintenance of the existing PCB contaminated cells; and the soil excavation and off-site shipping of PCB-contaminated and non-hazardous materials.

Non Hazardous Material

The following wastes will be considered non-hazardous, and will be disposed of in an on-island landfill:

- Miscellaneous debris
- Treated soil <1 ppm PCBs

Soil will be segregated based upon the cleanup criteria. Soil sampling is described in the Sampling and Analysis Plan (SAP) for this project.

Transportation

The non-hazardous material will be transported by ECC in dump trucks. Each dump truck will be inspected for structural integrity prior to loading. Prior to departure, each dump truck will be inspected to ensure that the cover is secured.

Vehicles that enter known contaminated areas will be decontaminated prior to leaving the site in accordance with the ECC Site Safety and Health Plan. Each vehicle leaving the site will be inspected at the vehicle decontamination pad to ensure that no soil adheres to its wheels or undercarriage. All excess soil will be removed.

ECC anticipates that the average daily truck traffic will not exceed three trucks arriving and/or leaving the site. However, during peak periods, no more than 15 trucks will arrive or leave the site on any day. The peak period will not exceed one week. In addition, diesel fuel oil will be delivered to the on a daily basis in a tank truck, to replenish the fuel supply for the Indirect Thermal Desorption (ITD) system.

Disposal

The designated on-island disposal facility is:

Puerto Rico Landfill
Division of Solid Waste Management
Department of Public Works
Lower Base
Saipan, MP 96950

(670) 322-2745

Hazardous Material

The following wastes will be considered hazardous, and will be disposed at an off-island, EPA permitted, Transportation, Storage and Disposal Facility (TSDF):

- Decontamination water
- Treated soil (filter cake) exceeding 1 ppm PCBs
- Investigation-derived waste debris exceeding 1 ppm-PCBs
- Cell liner materials
- Personal Protective Equipment (PPE)

Waste will be segregated into non-hazardous and hazardous through sampling and analysis, as described in the SAP for this project.

Packaging

Solid waste will be packaged in US Department of Transportation (DOT) approved, 1-cubic yard capacity supersacks, each with a 6-mil waterproof liner. Each sack will be weighed on a portable scale, and assigned a unique, sequential identifier for tracking purposes. Decontamination water will be contained in UN 1A1 rated 55-gallon, steel closed-top drums. As with the supersacks, drums will be numbered sequentially for tracking purposes. Container loading forms will reflect the number of drums, as well as each drum's unique identifier.

Each waste container will be sealed, labeled, and stored on-site in 20-foot or 40-foot, steel shipping container (seavan). Each seavan will be placarded and marked in accordance with DOT regulations for the waste being shipped [RQ, Polychlorinated Biphenyls, 9, UN2315, II (marine pollutant)]. After stowage, ECC will block and brace any void spaces to prevent shifting of the load in transit. The shipping container will then be sealed for later transport to the harbor. The seavans will be staged in the site support area until shipment day.

Transportation

Waste transportation will proceed as follows:

1) Seavans will be transported by truck from the site to the harbor facility;
2) seavans will be loaded onto a barge and transshipped from Saipan to Guam;
3) seavans will be transferred from a barge to a container ship and shipped to the US Mainland; and
4) seavans will be offloaded at the port of discharge, and transported by truck to the designated TSDF for disposal.

ECC will contract with the following freight agent to arrange for transportation of shipping containers from the on-site storage location to the harbor loading facility (Transporter #1):

Saipan Stevedore Company, Inc.

PO Box 208
Commercial Port
Puerto Rico, Saipan, MP 96950
(670) 322-9240

From the harbor facility, the seavans will be shipped to Guam, for transshipment to the US Mainland. The following shipper will be used to transport the waste from Saipan to Guam (Transporter #2):

Saipan Shipping Company, Inc.
P.O. Box 8
Puerto Rico, Saipan, MP 96950
(670) 322-9707
EPA ID #TTD982513392

Barges depart Saipan for Guam twice a week, on Sunday and Monday. ECC will coordinate with Saipan Stevedore Co., so containers will be transported to the harbor facility within the minimum timeframe required by Saipan Shipping Co. to load onto the barge departing Monday. This will minimize the time that seavans are required to be staged at the Saipan harbor facility, yet will allow connection in Guam with Transporter #3 (see below).

After the waste has reached Guam, the following carrier (Transporter #3) will transship it to the US mainland:

Matson Navigation Company
PO Box 7452
San Francisco, CA. 94120
(800) 462-8766
EPA ID #052799001012H

Matson sails from Guam every Tuesday for the US Mainland. Therefore, the seavans will be on Guam for less than one day per shipment. The seavans will be shipped to the Port of Oakland, CA, or to the Port of Los Angeles, CA, as an alternative. Once the seavans are offloaded, they will be transported inland by the disposal facility. ECC will coordinate with a custom's broker, as well as with the disposal facility, to ensure that seavans are cleared from the port and transported inland with a minimum of standby time.

ECC anticipates one off-island shipment per month, consisting of approximately 5 seavans per shipment.

Disposal

The following facility is designated for disposal of off-island wastes:

Chemical Waste Management
35251 Old Skyline Road
Kettleman City, CA. 93239
(559) 386-9711
EPA ID #CAT000646117

Prior to initiating remediation activities, ECC will notify the appropriate local authorities of activities involving the transportation of large equipment and hazardous waste to and from the site. Spill Prevention and Control Plan

ECC will be responsible for any spills or leaks during the performance of this contract. ECC will provide contingency measures for potential spills and discharges from trucks handling off-site transportation and any other potentially hazardous materials on-site.

2.11.3 SUMMARY OF ESTIMATED COSTS

Design/Submittals	1	LS	$50,000.00	$50,000.00
Mobilization/Demobilization	1	LS	$250,000.00	$250,000.00
On-Site Indirect Thermal Desorption	20,000	TONS	$275.00	$5,500,000.00
Packaging	400	TONS	$112.00	$44,800.00
Transportation to TSCA-approved landfill	400	TONS	$614.00	$245,600.00
Waste Disposal at TSCA-approved landfill	400	TONS	$100.00	$40,000.00
Placement of Treated Soil - On Island	20,000	TONS	$3.44	$68,800.00
Miscellaneous (fees, insurance) - estimate 10% of costs	1	EA	$614,920.00	$614,920.00
TOTAL COST:				**$6,764,120**

2.11.4 EXPECTED OUTCOME

The expected outcome of the selected remedy is described below.

The land upon which the stockpiled soils are currently sitting can be restored back to open space as it was before. The stockpile cells and other improvements necessary for operation of the ITD unit will all be removed upon completion of soil treatment. The time required for soil treatment, and site restoration is estimated to be 6 months.

The purpose of this response action is to control risks posed by direct contact with PCB contaminated soil. This remedy will address soils contaminated with PCB 1254 in excess of 1.0 ppm. Treatment of the stockpiled soils will be monitored to ensure that the clean-up level of 1.0 ppm is achieved.

The anticipated environmental and ecological benefits will be that PCB 1254 contained in the stockpile soils that were previously excavated in the area will be removed from the environment.

2.12 STATUTORY DETERMINATIONS

The selected final remedy, consisting of treatment of the stockpiled soils in the ITD unit to a level of 1 ppm or lower of PCB 1254 will protect human health and the environment through elimination of the contaminant of concern from materials that will remain on the island. The treatment residuals that contain PCB 1254 above the cleanup level of 1 ppm will be properly removed from the island and disposed at a disposal facility in the United States mainland permitted to receive these waste materials. The remedy will comply with ARARs, as identified in the discussion in this document. The selected remedy represents the best alternative among those that meet the CERCLA criteria, and provides a permanent solution to the PCB contamination at the site. The selected remedy also complies with the requirements of the EPA Administrative Order. It will be completed by USACE to achieve compliance with the Order and with CERCLA, the NCP and the DERP statute.

2.13 DOCUMENTATION OF SIGNIFICANT CHANGES

There are not significant changes from the preferred alternative proposed by USACE as the final remedial action for this site.

3.1 RESPONSES TO MR. BUD WHITE'S COMMENTS ON INTERIM DRAFT TREATMENT PLAN, TANAPAG VILLAGE, ISLAND OF SAIPAN, CNMI.

The available documents do not make clear how much water will be needed for the ITD system on an on-going basis. Tanapag is on water hours as it is, and some accommodation would have to be made if the treatment system were to exacerbate the present situation. It has been said that salt water could be used in the process, but we have seen no indication that it will be used instead of city water.

After considerable review and discussions with CUC, a dedicated water well will be installed to provide the water on a continuous basis to the ITD. Brackish water may be utilized. RAW seawater is not desirable.

Island power in general, and power on Tanapag's feeder in particular is not reliable. The village suffers periodic unannounced power outages. The available documents / information would seem to indicate that it is important that the ITD process not be arbitrarily interrupted. Yet there is no indication that the unreliability of power has been accommodated. A generator is needed that will automatically take over should power fail. Provision also needs to be made to protect against power fluctuations.

CUC has promised to notify ECC at least 30 minutes before feeder 7 (Tanapag) is taken off line. Also, CUC may request ECC to discontinue service to meet generation commitments. ECC will provide a primary generator and use CUC power as backup.

The documentation indicates that air pollution, either from dust, or from gases created in the ITD process, are of concern. Assurance is needed that no hazardous gases will escape the system, that no harmful pollution will occur, and that nuisance pollution, such as dust, will be kept to an absolute minimum.

All release points for vapors are continuously measured to assure emissions are in compliance. Fugitive (visible at fence) dust emissions will be measured and cease operations levels set based on analytical results during start up. Ambient air will be monitored, both in a real time mode (dust) and time weighted average (TWA) for PCB's.

The treatment system is expected to operate 24 hours a day. There is no indication of how much noise the system generates, and what steps will be taken to minimize noise, particularly nights, weekends, etc.

The system does generate some noise during operations. Noise mitigation will be accomplished by arranging the plant such that the loud side faces the ocean, thus reducing exposure. The only expected weekend operation is ITD treatment. Excavation and soil handling operations such as crushing will occur during weekdays.

The treated soil will, apparently, be sterile. I believe it is the responsibility of the ACE/contractor to restore the soil to its original organic condition.

The soil will be amended to restore its organic content, as described in earlier responses.

Cemetery #2 is adjacent to the site where the PCB laden soils are being stored and may be cleaned or removed from this site. What will the impact be during cleanup operations to the use of the cemetery? For example what will the impact be to the people who are visiting the cemetery? How about burials? What about "All Souls Day" and other religious holidays? The people from the village of Tanapag sue this cemetery every day and they want to know what will happen to their use during the treatment or removal of PCB laden soils?

The cemetery proper will be open for public use. Arrangement can be made, with advance notice to allow, for uninterrupted use of the cemetery during burials and religious holidays. On such days, ECC will shut down the system and use the day for maintenance. A fence will be built around the treatment area.

What are the risks of neighboring properties being contaminated from airborne dust that conceivably will result form all the soil movement into the treatment process? Have these risks been quantified?

Since the nearest resident in not for 100s of meters from the plant, risks are minor. Dust control will be used lower any airborne risk: stockpiles will be covered when not in use, there will be minimal handling of the dirt, and perimeter air monitoring will occur during treatment.

In the treatment plan you mention that in the case of a contamination leak that people will be moved to other facilities. Have you considered the 3,000 Chinese garment workers, which live within a few hundred yards of the site? Will you brief these people about what is going on and any potential danger? Is there any probability for an international incident, which could be raised for political reasons by the government of China regarding their citizens? Have you had discussions with the U.S. State Department on your plans?

ECC has taken into account a ¼ mile radius for containment purposes. Public meetings will be available for information about treatment and information will also be on hand at the site. See the public relations plan by the USACE.

In the treatment plan you mention that you intend to connect to public utilities. I would caution you to have backup water storage and back up generator power. The Commonwealth Utilities Corporation (CUC) sometimes has problems delivering water 24 hours per day. Power can also be down because of storms and equipment problems at the CUC generating plants. If you intend to connect to the CUC sewer line they will probably want you to install a holding tank and assure that no chemicals are inadvertently introduced into the sewer system.

ECC will be prepared for back up power and storage tanks. ECC is exploring the possibility of using other sources of water, such as drilling a well, or a tank for storing rainwater. For example, pursuant to consultation among ECC, the CNMI Commonwealth Utilities Commission (CUC), and the DEQ, it appears it will be necessary to install a well to draw brackish water from the tidal aquifer in order to operate the ITD unit. Use of this non-potable water will avoid an adverse impact on the community's drinking water supply.

When you do the detail design for the site installations on Saipan you should consider the following: (a) Torrential rains; (b) Typhoons; (c) Tidal surges; (d) Earthquakes; (e) High ambient temperatures coupled with high humidity.

ECC concurs. The ITD equipment will not be operated in severe weather conditions.

The site should be designed to withstand 200-mph winds. The last super typhoon occurred on 3 Dec 1986. Winds were in excess of 200 mph in the village and there was a tidal surge greater than 14 ft. Note this is 10 ft above the current site elevation.

The system is rated at 150-mph. In the event that strong winds are expected, the system will be locked down and sealed. A super typhoon or a large tidal surge will cause some damage to the equipment. Recovery of the damage should not exceed four weeks.

You may also want to consider building a berm around the entire site. This would mitigate rainwater incursion and should keep chemical spills from leaving the site.

An 8" concrete curb will be constructed in the ITD treatment area to contain spills and water incursion. Large storm events will cause a shut down and the site secured to prevent the spreading of contaminated soil. In addition, contingencies have been established for potential chemical spills, and will be followed.

I see in your plan that you have 1 person assigned ½ time for quality assurance. I question if this is enough coverage for a 24hr-7day/week operation. I also wonder about his objectivity when he has responsibilities as the thermal engineer.

The thermal engineer will not be assigned the Quality Assurance position. However, the thermal engineer's main objective is efficiency and timely compliance, therefore quality and safety are part of his responsibilities.

Quality assurance is considered procedures and protocols for work. Quality Controls rest with individuals. One part time quality assurance employee will be assigned, with independent corporate control.

The thermal engineer will not be assigned the Quality Assurance position. However, the thermal engineer's main objective is efficiency and timely compliance, therefore quality and safety are part of his responsibilities.

I couldn't find anywhere in your plan where you would shut down because of weather conditions and secure the site. I may have missed it but if not, weather should be considered.

This information is covered by the 60% availability mentioned in the text. This includes site shutdown during severe weather systems.

Equipment maintenance on Saipan is challenging. In addition to high humidity, where everything rusts, we are a long way from civilization. Has anyone identified single point failures for the ITD process? Will there be adequate spare equipment on island to deal with these failures?

Yes, this has been taken into consideration and ECC will have several containers of spare parts on hand. Additional parts are available from the mainland, if needed.

I see that you intend to reduce the current stockpile of 20,000 tons of contaminated PCB laden soil to 400 tons. You then intend to utilize Fentons Reaction on these 400 tons of residue. I was not aware that it has been demonstrated that you can reliably reach less than 1 ppm of PCB's with the Fentons Reaction process. Have you considered just shipping the 400 tons of residue off island and not even attempt to treat this residue with a Fentons Reaction process?

The 400 tons will be packaged and shipped off island. Fentons Reaction will not be used. The references will be removed from the plan

The current work plan should be completed and updated to reflect exactly how the processing will be done and what instrumentation will be added to automate the process as much as possible. Data from the instrumentation should be published on a web site and be available to concerned citizens in real time.

There should be no out gassing or emissions from the process unless they are instrumented and continuously monitored. When limits are exceeded, including airborne dust the process should be immediately stopped automatically.

At the end of the process where the concentrated PCB's are collected in a cake from the filters this should be automated and completely contained. The cake should be placed in storage drums with the minimum of personnel handling ready for off island shipment.

There should be a detailed plan dealing with the handling and shipping of the residual 400 tons of soil/cake after processing. This plan should specifically address all handling steps and all interim storage facilities either in Guam, Hawaii, or the US mainland before ultimate destination. Are there going to be any problems along the way? Lets identify and work on those ahead of time. Someone may want to run this by Green Peace and the Sierra Club. Are there going to be any problems with shipping the 400 tons of material back to the US as far as territorial waters or port of entry? Again lets identify any of problems ahead of time and work them so we don't have a ship with 400 tons of PCB laden soil steaming up and down the west coast of the US.

At the conclusion of the cleaning operation and after the residual soil and equipment has been removed the area should be landscaped and made into a park complete with paved parking area and playground equipment. I think it would be the right thing to do for the people of the village of Tanapag.

ECC should also plan on bringing their own power generator and drilling a well for water.

I would like to be advised when the final work plan is revised and ready for review. I would also like to see the detailed plan for dealing with the residual 400 tons of soil/cake after processing.

The ITD plan will be updates to reflect these comments as well as those received from the EPA.

ECC and the USACE is evaluating and considering the real time display of data.

The instrument interlocks do account for any condition that could create out gassing. Real time monitoring is present for dust. The feed will stop during high dust events.

Filter cake is managed as a toxic waste. Some manual handling of the filter cake is required, and will be done in accordance with safety protocol. The filter cake will be stored in lined sacks and stored in containers for offsite shipment.

3.2 RESPONSES TO THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS (CNMI) DIVISION OF ENVIRONMENTAL QUALITY (DEQ) COMMENTS ON THE FOCUSED FEASIBILITY STUDY AND PROPOSED TREATMENT PLAN FOR REMEDIATION OF THE PCB CONTAMINATED SOILS AT THE TANAPAG VILLAGE, SAIPAN, CNMI

I. <u>Focused Feasibility Study</u>

The Focused Feasibility Study ("FFS") evaluated ten remedial action alternatives to address the polychlorinated biphenyl ("PCB")-contaminated soil stockpiled in Tanapag Village, Saipan. The U.S. Army Corps of Engineers, Honolulu District ("ACE") excavated and stockpiled the approximately 20,000 tons of PCB-contaminated soil during its Phase III removal action. In general, the Division of Environmental Quality ("DEQ") comments that the effectiveness of the FFS is compromised by the lack of an adequate characterization of the waste soil targeted for treatment. DEQ also requests that ACE reconsider, and provide more detail regarding the decision to eliminate alternative 4D, On-Site Treatment by ITD and PCB Destruction by Base-Catalyzed Dechlorination.

A. General Comments

1. Waste Soil Characterization

DEQ maintains that an analysis of the alternatives for remediation of the contaminated soil piles stored in Tanapag requires a thorough characterization of the waste soil. It is known that a military fuel farm was located in Tanapag Village and that fuel storage tanks remain scattered throughout Tanapag. While ACE maintains that this remediation focuses on PCBs, choosing an effective remediation method requires knowledge of all hazardous constituents in the waste soil piles.

The FFS lacks any discussion of the characterization of the soil, and therefore, does not address whether the proposed alternatives will address hazardous constituents other than PCB that may be present. This is of particularly high concern if ACE plans to return treated soil to residential sites in the village where exposure to individuals may occur.

DEQ understands that a waste characterization was performed on the stockpiled soils and has reviewed the preliminary results. The results indicate that TCLP analyses were performed for all contaminants except PCB, dioxins, and dibenzofurans. This type of analysis is generally used to determine whether a material is a hazardous waste as that term is defined in USEPA regulations. It tests whether a particular hazardous constituent will leach out of the material at levels of concern.

For the purposes of the FFS, TCLP analysis is not the most appropriate method for the characterization of the waste soil piles with regard to many of the alternatives proposed. The objective in testing the soil piles is to determine: (1) whether other chemicals of concern are present in the soil at a level that could interfere with the evaluated treatment methods; and (2) whether the treatment method ultimately chosen will reduce any hazardous constituents other than PCB to a level that is safe for residential exposure. The TLCP test does not address these concerns – only a direct test of the soil for the presence of other hazardous constituents will allow ACE to consider whether the remediation methods proposed will deal with any other constituents, and ultimately, whether the treated soil is appropriate for residential areas.

In order to consider this factor fully, based on the history of the site, ACE should, at a minimum, analyze the waste soil piles for copper, mercury, total organic carbon, polycyclic aromatic hydrocarbons, chlorobenzenes, lead, arsenic, and cadmium using methods that measure the actual level of these constituents in the soil. DEQ requests that ACE provide a list of test methods and detection limits associated with each parameter for DEQ's review.

The FFS was prepared to evaluate the remedial alternatives for PCB contamination. Specified parameters were assumed as 7% fines, 18% moisture, 300 BTUs per pound, and 5,000 ppm TOC for all technologies evaluated. Available data from the removal actions provided adequate information for the alternatives analysis presented in the proposed plan and FFS. The Corps believes that these values are consistent with the site conditions. Soil characterization was *adequate to evaluate the alternatives and to support selection of the proposed remedy. Chemical characterization of the PCBs was adequate for evaluation of the alternatives. Any additional data will be used to refine the remedial process rather than for remedy selection. If the basic performance criteria of attaining 1 ppm residual PCB could not be met by an alternative technology, additional data was not and will not be sought to further evaluate that alternative because it does not satisfy the cleanup criteria on its face.*

We used TCLP, a standard test to determine whether a media is hazardous waste, to test the stockpiles. We consider TLCP to be adequate to do our baseline survey of the stockpiles. The results of the TCLP demonstrate that the stockpiled soil has no leaching metals and therefore is not hazardous waste. We agree that we need to perform additional testing of the stockpiles to identify any contaminants that may need to be considered and tested for during the POP test. We will perform this additional stockpile testing prior to operation of the ITD unit. We will provide the DEQ with a list of the tests we propose to do as requested.

The ITD process will successfully remove organic carbon, PAHs, chlorobenzene and any other organic material that may be found in the stockpiled soils. The process will not remove metals such as copper, arsenic or cadmium. However, these metals and organic compounds are not generally found in association with PCB capacitors and are not among the contaminants of concern for this remedial action. We will sample and test the treated soils for compliance with the cleanup criteria for PCB and to determine if hazardous wastes are present before placement. We will include the type of testing we propose to do in the workplan for review and discussion with DEQ and EPA.

2. Alternatives 4B and 4C

Four of the ten alternatives evaluated in the FFS are the Indirect Thermal Desorption ("ITD") process coupled individually with four different chemical processes to destroy the PCBs extracted by the ITD process. In section 7.3, ACE rejects alternatives 4B (ITD and Solvated Electron Technology) and 4C (ITD and Gas-Phase Chemical Reduction) due to a lack of evidence that they can meet the remediation goal of 1 ppm. ACE did not perform field pilot testing to demonstrate that the treatment methods are capable of destroying PCBs to less than 1.0 ppm. DEQ is unable to evaluate and to provide comment on alternatives that must be rejected due to lack of testing. Including these alternatives in the FFS without tests to determine if they are capable of reducing PCB levels in soil from Tanapag below 1 ppm seems to defeat the purpose of their inclusion.

The four chemical processes that were considered for treatment of the ITD residuals were rejected because it has not been demonstrated that these methods are capable of destroying PCBs to meet the remediation goal in the soil (matrix) at Tanapag coupled with the ITD process. Therefore these technologies will not be protective of human health and the environment. Nor would their use on this project achieve the ARARS. Therefore they fail the threshold criteria.

The purpose of a focused feasibility study is to limit the comparative analysis of alternatives to those alternatives that have successfully achieved commercial application in the marketplace. A FFS is not required to conduct production level pilot tests of the type necessary to establish whether the post ITD treatment method will meet the remediation objective.

3. CNMI Permits

The FFS assumes that local permits are not required to implement any of the remediation options presented so long as the remediation takes place "on-site." DEQ disagrees with this assertion and maintains that ACE must comply with CNMI permit requirements triggered by the remediation method ultimately selected.

In considering the "no action" alternative, the FFS states that "the implementation of this alternative is assumed to be exempt from any permit requirements in accordance with CERCLA." (FFS at 7-2.) Later in the document, a more detailed discussion occurs, which explains that CERCLA § 121 and the National Contingency Plan ("NCP"), 40 C.F.R. § 300.400(e) "provide that permits are not required for federal agency removal or remedial actions conducted entirely on-site, and when such response action is selected and carried out in compliance with CERCLA." (FFS at 7-8.)

The reliance on CERCLA §121(e)(1) is misplaced for several reasons. First, this remedial action is being proposed and executed under a RCRA § 7003 order. See USEPA, Region IX Final Administrative Order In the Matter of Tanapag Village Saipan, Commonwealth of the Northern Mariana Islands (hereinafter "FAO"). RCRA does not excuse federal agencies from obtaining state permits applicable to their activities. The order states that compliance "shall not relieve Respondent of its obligation to comply with RCRA and/or any other applicable State…law, regulation, permit, or other requirement." FAO at 16, § XXIV(4). Second, the CERCLA exemption applies only to removal or remedial actions selected in compliance with CERCLA § 121. DEQ disputes that the remedial selection process complies with § 121. For example, ACE designed, tested, and prepared a draft implementation plan for a remedial option before a FFS was ever prepared and before public comment on the remedial alternatives. This is not in accordance with CERCLA or the NCP. Finally, even if the CERCLA permit exemption applies, ACE must comply with the substantive requirements of CNMI law applicable to any remediation.

We will comply with the substantive standards of CNMI law and regulation that are applicable, i.e., enforceable, against the United States. In addition, we will comply with the CNMI substantive standards that are not enforceable, if they are reasonable and technically feasible. Please provide us citations to and copies of the substantive standards which the CNMI believes bear on this remedial action, and provide us the name or names of people within the DEQ that can help us work with these standards to achieve compliance with them. The Corps and its contractors have enjoyed a helpful relationship with the DEQ on these technical compliance issues during the removal phase of this project, and we believe that all parties are committed to continuing this relationship through completion of the remedial action.

The US Army Corps of Engineers is undertaking this cleanup action under the Defense Environmental Restoration Program (DERP), 10 USC 2701 and following, on behalf of the Department of Defense (DOD). The DERP is divided into the Installation Restoration program (IRP) for current military sites, and the Formerly Used Defense Sites program (FUDS) for sites formerly used by a military department. The DOD has delegated responsibility to execute the FUDS program to the Department of the Army (DA) who has re-delegated it to the Chief of Engineers.

10 USC 2701 provides that program activities "shall be carried out subject to, and in a manner consistent with, Section 120 (relating to Federal facilities) of the Comprehensive Environmental

Response, Compensation, and Liability Act of 1980 (hereinafter in this chapter referred to as 'CERCLA') (42 USC 9601 et seq.)." 10 USC 2701 and following provides the authority and the funding for the Corps to undertake the PCB cleanup at Tanapag.

On December 20, 2000, the USEPA issued a RCRA administrative order to the Department of the Army which addressed this previously existing, on going cleanup effort. The effect of the order is to give the USEPA regulatory oversight of the project. However, the order does not modify or change the project's statutory authority or funding stream. In fact, the order provides at Article XXIX that nothing in it requires the Army to violate the Anti-Deficiency Act, 31 USC 1341 and following. If this project is not a DERP FUDS project executed subject to CERCLA, the Corps has no present authority or funding to execute it. Expending funds without authority is the essence of an Anti-Deficiency Act violation.

In accordance with CERCLA, 42 USC 9621, no Federal, State, or local permits are required. Federal and State standards are enforceable if the project is required to conform with them, i.e., if they apply. The Corps stated its view on the inapplicability of the CNMI's recently issued and adopted harmful substance regulation to this project in its letter to the CNMI DEQ dated July 19, 2001.

The Corps, after meetings with the DEQ, the Tanapag Action Group (TAG) and the USEPA in May and July of 2000, authorized its contractor to proceed to develop an indirect thermal desorption (IDT) unit that could be used at Tanapag. We understood that this equipment would take up to a year to construct. Now that the equipment is constructed, it does not have to be used at Tanapag.

We have received public comment on the Focused Feasibility Study and Proposed Plan and testimony at the formal public meeting on July 11, 2001. These have confirmed that ITD is the best alternative to remediate and reduce the volume of PCB contaminated soils at Tanapag Village, followed by shipment off island of the residual material. We hope to proceed to remediate the PCB contamination at Tanapag using the ITD technology if the USEPA under RCRA and the Secretary of the Army under DERP and CERCLA approve this alternative.

4. Community Acceptance Criteria

Please clarify how much weight the community acceptance criteria will have over the other two major criteria when ACE makes the final determination of which remediation option it will propose for USEPA approval.

The Corps evaluated and proposed a remedy in accordance with the nine criteria for evaluation set out at 40 CFR 300.430 and accompanying guidance on how modifying criteria is to be considered when selecting a remedy. The remedy the Corps proposes is protective of human health and the environment and complies with the ARARS and the RCRA administrative order. The Corps is making every reasonable effort to address the community's concerns as identified in the public review process. In accordance with CERCLA and the NCP, a remedial alternative may not be selected if it does not satisfy the two threshold criteria or protectiveness and compliance with ARARs. The other seven criteria, including community acceptance, are considered by the final decision-makers as they select among alternatives that can meet the threshold criteria.

B. Specific Comments

1. Alternative 1, No Action

The estimated capital cost to implement this option is $1,039,500. The estimated annual Operation and Maintenance cost is zero dollars. In the description of the alternative, the FFS states that it *may* include monitoring and/or institutional control. Such controls should not be discretionary; they should be required. The severe weather conditions such as typhoons that are experienced seasonally in the Pacific mandate that this option include controls to deal with long-term storage. The cost for the long-term operation and maintenance of this option needs to be considered in the FFS.

The NCP at 300.430(e)(6) mandates the evaluation of the no action alternative in the FS process as a baseline. Because the materials had already been excavated under the time critical removal action and placed in a temporary storage area not intended for permanent disposal, a true no action alternative was no longer viable. Simply leaving the temporary storage area with materials that exceed the limits of the EPA order is not acceptable to USACE, and presumably also not to EPA and DEQ. The no-action alternative we discussed in the FFS was not a true no action alternative. We should have discussed a no cost, no action alternative rather than No Action with institutional controls. We evaluated off site encapsulation rather than on site encapsulation for the encapsulation alternative because the community has always and consistently required that the contamination be removed from their village. Further, there are tsunami inundation and project size constraints associated with an on site encapsulation alternative that eliminated it from consideration. Evaluation of a no action alternative is mandated by the NCP, Section 300.430(e)(6) as a baseline. An institutional controls alternative would not be a no action alternative. USACE agrees that taking no action with regard to the stockpiled soils is not acceptable, and therefore the Proposed Plan did not recommend that as the preferred alternative.

2. Alternative 2A, Off-Site Disposal

The FFS identifies the requirements of the Jones Act as a limitation in implementing this alternative. As described in the FFS, the Jones Act "requires that a U.S. flag carrier be used to transport shipments between U.S. ports." (FFS at 7-1.) Because ACE has identified only two U.S. flag carriers that serve the Marianas, the FFS considers this requirement a limiting factor in the feasibility (i.e., availability of ships and time required for shipment) and cost of shipping all of the waste off-island. (FFS at 7-5.)

Please provide more detail on the statutory or regulatory authorities that require that U.S. flag carriers must be used to transport shipments between U.S. ports. The Cargo Preference Act of 1954, 46 U.S.C. § 1241(b) (also known as the Merchant Marine Act of 1936 § 901(b)), appears to require that U.S. flag carriers be used for 50 % of such a shipment. Can ACE confirm that 48 C.F.R. § 247.572-2 requires the use of U.S. flag carriers for 100 % of the shipment in this specific situation?

The Covenant between the US and the Commonwealth of the Northern Mariana Islands specifies federal law that applies to US agencies implementing federal actions in the CNMI. Section 502(b) of the Covenant provides:

(b) The laws of the United States regarding coastal shipments and the conditions of employment, including the wages and hours of employees, will apply to the activities of the United States Government and its contractors in the Northern Mariana Islands.

Therefore, when an agency of the United States conducts a US activity in the CNMI that is funded with US dollars, the US coastal shipping laws apply. Among U.S. laws regarding coastal shipments, the Jones Act requires ships travelling between two U.S. ports to be built in U.S. shipyards, owned and operated by U.S. citizens, and to have an American crew. This law is dispositive as to the requirement use a US flag ship for shipments between the CNMI and the United States.

The CNMI comments referred to the Cargo Preference Act. The Cargo Preference Act requires that U.S. flagged vessels be used in the transportation by sea of supplies purchased by the military unless the freight charged by those vessels is "excessive and unreasonable". As a general rule, a U.S. flagged vessel must ship any cargo shipped in the performance of a government contract. 48 CFR 572-2 establishes a procedure for the contracting officer to follow in making and documenting a finding that proposed freight charges for a U.S. flag vessel are excessive or otherwise unreasonable. It has been the Corps's experience that freight charges between the CNMI and the US are not excessive or otherwise unreasonable.

Given the present estimated cost of this alternative, it seems likely that if this option were selected, remediation of the waste piles could be significantly delayed by funding constraints.

This is correct.

Does the ACE have access to the $18 million needed to remove the PCB contaminated soil off-island for disposal?

Congress will appropriate funds for the remedial action on this project as part of the FUDS Environmental Restoration Account appropriation for Fiscal Year 2002. Congress has not yet passed legislation to authorize or appropriate those funds. USACE has not programmed and requested funds for the higher cost alternative of off-island disposal as it is not the preferred alternative and does not best meet the remedy selection criteria of CERCLA and the NCP. If a decision is made to select off-site disposal as the final remedy, funds will be requested from the FUDS-DERA to pay for the cost of the remedy. Under the circumstances of this site, this remedial action is relatively high priority within the FUDS program. It is likely, however, that changing the remedial alternative at this point to a significantly higher cost remedy would delay receipt of adequate funds and therefore delay implementation of the remedy.

If not, how long will it take ACE to implement this option including a search for the necessary funding?

We do not know. We selected a remedy by following the CERCLA process. We came up with a recommended alternative that is protective of human health and the environment, complies with the ARARS and the RCRA order, can be implemented in less than a year, and costs much less than off island disposal of the untreated contaminated soil. There are risks associated with leaving these stockpiles of contaminated materials in places over long periods of time while waiting for funding. USACE has requested and programmed funding adequate to proceed with the recommended remedial alternative.

3. Alternative 2B, Off-Site Encapsulation

The FFS states that "[a]lternative 2B consists of off-site disposal of stockpiled soils to a RCRA Subtitle D-like waste management unit constructed on Saipan to permanently contain PCB-impacted soils." (FFS at 7-6 § 7.2.3.) It is not clear why RCRA Subtitle D is chosen as the standard for the waste management unit. In the discussion of Alternative 2A, Off-Site Disposal, the FSS considers disposal of the stockpiled soils at an appropriate disposal facility on the U.S. mainland. Section 7.2.2 states that "soil and concrete/asphalt debris that have PCBs at a concentration of less than 50 ppm are considered a solid waste" and may be disposed of at a RCRA Subtitle D facility. (FFS at 7-4.) However, soil and debris "that have PCBs at a concentration of greater than or equal to 50 ppm will be taken from the site for disposal at a TSCA-approved PCB disposal facility." (FFS at 7-4.) Please clarify the difference in the standards applied to the waste management units on the U.S. mainland and on Saipan. Why would a similar distinction not be made on Saipan as to the requirements for a waste management unit to handle materials contaminated with PCBs at a concentration above 50 ppm?

Section 4.2 of the FSS contributes to the confusion identified in the proceeding paragraph. This section states that "non-liquid PCB remediation wastes containing less than 50 ppm may be sent off-site for disposal in…a *traditional RCRA Subtitle C* landfill…" (FFS at 4-1 (emphasis added).) It goes on to state that "PCB remediation waste with concentration at or above 50 ppm may be sent off-site for disposal to a TSCA incinerator, TSCA chemical waste landfill or RCRA Subtitle C landfill." (FFS at 4-1.) Standards for RCRA Subtitle C, RCRA Subtitle D, and TSCA facilities are not the same. DEQ requests that ACE clarify which standards it would apply to the waste management facility on Saipan that is discussed in Section 7.2.3.

Soils considered for off-site encapsulation under Alternative 2B have a wide range of PCB concentration. For the purpose of the FFS, it was assumed, conservatively, that a significant portion of the stockpiled soil would have concentrations at or above 50 ppm, although data from the stockpiles indicates that most of the excavated soils are 50 ppm. Soils with PCB concentration of more than 50 ppm must be treated or disposed of as required by the Toxic Substances Control Act (TSCA) (40 CFR 761.60).

The first sentence of the description of Alternative 2B should be changed to read: "Alternative 2B consists of the off site disposal of stockpiles soils to a TSCA compliant waste management unit constructed on Saipan to permanently contain PCB impacted soils." RCRA does not apply to the PCBs in the soils, per se. PCB contaminated soils, that is, soils containing less than 50 ppm, may be placed in a RCRA certified landfill. However, soils containing over 50 ppm, must be placed in a TSCA landfill.

Overall, DEQ finds that this alternative is neither suitable nor practical for the CNMI. First, it will limit future land use and development of the area surrounding the site used for the encapsulation. On a small island, land resources are precious. Second, Saipan is in a seismic zone and is subject to frequent typhoons. Severe natural conditions could compromise the safety of a waste management unit constructed on Saipan. Third, as the FFS points out, currently there are no RCRA- or TSCA-permitted disposal sites on Saipan. The technical expertise to handle an emergency at such a facility may not be available on the island if it is needed. Finally, it is not right to store hazardous waste material on the island untreated because it will harm future generations of the CNMI.

Comment noted. We concur with DEQ's view of this remedy and since preparation of the FFS, in the proposed plan and the final decision we have selected a more suitable remedy for approval and implementation.

4. Alternative 3B, On-Site Treatment by Incineration

Incineration will attempt to destroy PCBs by applying direct heat to the molecule. It is proven that the process can produce even more toxic pollutants like dioxin and furans from the combustion of PCB. (FFS at 7-12.) This is a big risk to take, even if the system has very stringent requirements for operation. How will ACE deal with a failure of the air emissions control system? If the air emissions control system should fail at any point in the treatment process, will the overall system retain any toxic emissions (i.e., dioxins or furans) generated before the unexpected shutdown occurred?

PCBs have been successfully and safely incinerated in specially designed incinerators for years on the Mainland. While it is true the incomplete or low temperature combustion of PCBs may lead to the formulation of dioxins and furans, PCB incinerators are designed with safety features to protect against the generation and release of harmful combustion bi-products. A failure to achieve the appropriate combustion temperature or failure of the air emissions control systems will result in an automatic system shutdown. In an emergency shutdown, everything is contained; nothing is released to the environment. One major reason that there are so few alternatives to incineration, for PCB destruction, is that incineration has been demonstrated to be safe, clean, cost effective and portable.

5. Alternative 4D, On-Site Treatment by ITD and PCB Destruction by Base-Catalyzed Dechlorination:

After application of the screening and evaluation criteria, the FFS retained four (4) remediation options – Off-site disposal, Off-site encapsulation with stabilization, on-site treatment by incineration, and on-site treatment by ITD with off-site disposal. (FFS at 7-23 § 7.3.) Soil stabilization with encapsulation does not remove or destroy the contamination present within the soils. Therefore, it does not represent the best available technology, and should only be considered as a last resort to other alternatives. The remaining on-site treatment options are incineration and ITD.

On-Site treatment by ITD and PCB destruction by Base-Catalyzed Dechlorination ("BCD") was considered as alternative 4D in the FFS, but rejected because ACE did not run bench-scale tests to demonstrate the effectiveness of the process on contaminated residuals from Tanapag. (FFS at 7-23.) DEQ understands that this technology is available and has been successfully used to treat PCB waste at a site in Warren County, North Carolina to very low levels using indirect thermal desorption and mixing a solid phase BCD reagent (such as sodium bicarbonate) in with the contaminated soils. Up to 95% chemical destruction was documented, reducing PCB concentrations from as high as 850 ppm to less than 0.003 ppm, and dioxin concentrations from up to 250 parts per trillion (ppt) to less than 3 ppt.

This may be a viable alternative process that ACE should consider more extensively in the FFS. A comparison of the BCD process mentioned above with ITD would help ACE and the CNMI determine whether ITD is the best option for the Tanapag site.

Base Catalyzed Dechlorination (BCD) is very effective for PCB contaminated liquids but will not be effective on the filter cake that is the residue from the ITD process. Application of the BCD process to the filter cake may increase the volume of the filter cake by a factor of ten. This will result in 4000 tons of residual material that must be disposed of rather than 400 tons. Additionally, the BCD treated residuals will be very oily and asphaltic and unsuitable for disposal on Saipan. If this material cannot be disposed of on Saipan, it will require transportation and disposal on the Mainland.

Use of the BCD process may require a pilot study performed in Saipan on the residuals from the ITD process applied to the stockpiled soil to insure that the 1 ppm remediation object can be met. In summary, Alternative 4D was rejected, as were the other three options that proposed a chemical treatment process be applied to the 400 tons of ITD residuals, because none of the chemical treatment methods have been pilot tested. It makes no economic sense to propose a treatment method, which must be pilot tested in Saipan, before it can be utilized. The cost of conducting a pilot test in Saipan, the extra time required to conduct the test, combined with the very real potential for the test to fail, make the application of BCD unacceptable from a cost and timeliness perspective.

6. <u>Alternatives 4E, On-Site Treatment by Indirect Thermal Desorption and Off-Site Disposal</u>

If this option is selected and approved by U.S.EPA, 400 tons of residual concentrated PCB must be shipped off-island to a mainland disposal site. How will ACE deal with the contingency if the disposal site selected experiences difficulties or ceases accepting waste from Saipan? What is the possibility that the concentrated residual PCB will remain on the island for an extended period of time if ACE encounters unexpected obstacles in shipment or at the treatment facility? What measures would ACE propose to plan for this possibility and mitigate the effects on Tanapag in the event that it occurs?

The Corps does not plan for the ITD residuals containing the concentrated PCBs to remain on Saipan. There are several mainland disposal options available to the USACE, anyone of or all of which, will be available to accept the ITD residuals. It is our intent to remove the residuals from Saipan as soon as possible. Storage of the PCB contaminated residuals will be done in a safe manner that complies with Federal standards for PCB storage. We have evaluated the logistics of shipping 400 tons of filter cake to the US through Guam to the US mainland. We have not identified significant problems since the quantity of material is small. We are continuing to work through the logistics of the shipping process, and if issues arise, we will work through them.

II. <u>Proposed Plan</u>

A. <u>General Comments</u>

The Proposed Plan ("PP") identifies Alternative 4E, On-site Treatment by ITD combined with off-site disposal of the residuals, as ACE's preferred remedial alternative for the Tanapag Village PCB clean up. (PP at 17.) The Interim Draft Treatment Plan sets forth ACE's proposal for the implementation of this option at the site. DEQ requested an extension of the comment period on the Interim Draft Treatment Plan so that it could focus on the first step of commenting on the

FFS and PP. It should be noted, however, that ultimate acceptance of the preferred alternative in the CNMI depends very much on the completed evaluation of the alternatives, the quality of the treatment plan and the conditions imposed in USEPA's Record of Decision. DEQ's comments on the PP and the brief comments on the Interim Draft Treatment plan set forth in this document should not be construed as DEQ approval of the preferred treatment alternative. DEQ plans to comment fully on the Interim Treatment Plan and expects that implementation of any alternative would occur only after EPA approval and the completion of a final treatment plan that is acceptable to all parties.

Comment noted.

After careful consideration of the alternatives and the FFS, DEQ finds that the proposed remediation method is feasible for implementation on Saipan provided that the scientific and engineering issues for this type of technology are satisfactorily addressed in a treatment plan. Again, DEQ's ultimate acceptance of the selection of the ITD treatment coupled with off-site disposal of the residuals is contingent on: (1) DEQ's comments on the FFS being satisfactorily addressed; (2) conditional approval by the USEPA; (3) the satisfactory resolution of numerous detailed issues that must be addressed in the interim draft treatment plan; and (4) the conclusion of a successful performance test of the ITD unit in Tanapag that demonstrates that all of the conditions set forth in a conditional approval issued by the USEPA are met.

The Corps looks forward to DEQ's participation and involvement in working through the issues pertaining to our executing a successful remedial action at Tanapag Village.

B. <u>Specific Comments</u>

<u>1. Introduction</u>

The introduction indicates that ACE and EPA will make the final selection of a remedy to be used in Tanapag. (PP at 1.) This implication is confusing to DEQ and the public. It does not make the distinction between the roles of the two federal agencies in the process of selection and approval. As DEQ understands it based on statements from ACE and EPA and the RCRA § 7003 FAO, ACE has proposed a remedy for the site, and it will either be approved or disapproved by EPA. The roles of the federal agencies should be clearly defined to the community of Tanapag.

DEQ's understanding is correct in that the Corps will evaluate and select an alternative in accordance with DERP and CERCLA, which must be approved by the Secretary of the Army unless delegated. In accordance with the RCRA administrative order, the USEPA must also approve the remedial method proposed by the Corps. The Corps and USEPA are working together to ensure that the remedial method ultimately proposed by the Corps will receive USEPA approval.

2. <u>Site Characteristics</u>

This section states that "approximately 4,000 cubic yards of contaminated soil was left in place at Main Cemetery *and covered by a layer of crushed coral*" at the conclusion of Phase II of the response action in Tanapag Village. (PP at 2 (emphasis added).) This statement is not accurate. A clear plastic liner was used to cover the stockpile left after Phase II. Members of DEQ's staff were at the site when ACE's contractor, TerraTherm Corporation, secured the pile before they left island. A layer of crushed coral was not used.

At the conclusion of Phase II two stockpiles of soil were left in place and covered with a heavy, highly heat resistant liner. The liner was in tact until the soil was removed during the Phase III activities in September of 2001. The two soil piles that were removed were a total of 300 cubic yards combined.

The 4000 cubic yards mentioned in the Proposed Plan was the estimated volume remaining in-situ at Cemetery II after a preliminary site characterization that took place at the end of the Phase II site operations. Portions of Cemetery II were cordoned off with signs and fencing to warn the public to avoid these areas. The portions of the cemetery that were outside of the fencing were covered with 6 mil plastic sheeting and than a 6 inch to 1 foot layer of crushed coral was placed on top to prevent public exposure in these areas. Members of the DEQ were at the site during these operations and helped in the process of laying the plastic sheeting.

This error is particularly disturbing given the present status of the holding cells containing the PCB-contaminated soil currently in Tanapag. The USEPA, Region IX Final Administrative Order (FAO) governing the Tanapag Village PCB site mandates that the holding cells containing the excavated soil "shall be designed to safely hold the contaminated soil/debris/equipment and to withstand high winds and rain from severe storms." (FAO at 7, § VIII(1)(A)(4).) More specifically, the FAO instructs: "Once the cell is filled to capacity, a 24-mil PVC liner shall be placed over the top of the stockpile. *An additional six inch layer of clean soil shall be placed over the liner* and the stockpile shall be sprayed with a chemical sealant." Id. (emphasis added).

The current soil stockpiles have not been secured with a layer of soil as required by the order. DEQ has written to ACE to express its concern over the vulnerability of the contaminated soil piles should a major storm event occur. See Letter from Antonio I. Deleon Guerrero, Acting Director, Division of Environmental Quality, to Ray H. Jyo, Deputy District Engineer, U.S. Army Engineer District, Honolulu dated April 12, 2001 (Attachment A). To date, a satisfactory response has not been received, and no further steps have been taken to secure the holding cells. See Letter from Ray H. Jyo, Deputy District Engineer, U.S. Army Engineer District, Honolulu, to Antonio I. Deleon Guerrero, Acting Director, Division of Environmental Quality dated April 30, 2001 (Attachment B).

The Corps is working closely with the USEPA to develop engineering controls that will function adequately to protect the health of the people of Tanapag and their environment until we can conclude the proposed remedial action. We will be submitting a new request to the EPA to revise the RCRA 7003 order to delete the addition of 6" of clean soil. We are working with EPA to establish a standard of protective performance for the stockpile stabilization. We believe that the engineering controls we have undertaken at the site, including our very recent activities there, will protect Tanapag Village, if we are able to proceed with the remedial action this fall. If the remedial action takes a longer time to implement, we agree that we may need to reevaluate these engineering controls in order to maintain an adequate level of protection.

3. Scope and Role

The PP indicates that this action to remediate the Tanapag Village PCB contamination will be the final remedial action at the site. (PP at 4.) To date, from the Phase I clean up action up to this Phase III action, less than 60 capacitors were found and no one knows the exact number of capacitors that were brought to Saipan. If one or more capacitors are discovered in the future, will the ACOE take action to address the problem immediately?

Yes, in the event further capacitors are discovered, the Corps will investigate to determine if the capacitors are those for which the DOD is responsible because of a former DOD activity, in accordance with FUDS. If DOD is responsible for them, we will address the problem as soon as possible, subject to availability of funds for the purpose.

4. Summary of Site Risks

This section contradicts statements made in later sections over the level of risk to human health at the site. The explanation of the risks states that "[a]ccording to the USEPA Region IX PRGs, a soil concentration of .22 ppm corresponds to a risk of one-in-a-million to develop cancer during a lifetime if the receptor is exposed to the soil for 6 years as a child, 24 years as an adult, spending 24 hours per day, 350 days per year at the site, inhaling 20 cubic meter of air per day, incidentally ingesting 100 mg/day of soil as an adult and 200 mg/day as a child and experiencing dermal contact with soil over significant portion of the body." (PP at 5.) It then states that "the PRG models the target level for remediation of 1.0 ppm corresponds to less than five-in-a million excess cancer risk." (PP at 5.)

These statements seem to mean that if the level of PCB in the soil at Tanapag is reduced to 1 ppm, this will correspond with a five-in-one-million excess cancer risk from exposure to soil. However, in the next section "Remedial Objectives" the PP asserts that the proposed action will reduce the excess human health risks associated with exposure to PCB contaminated soils to less than one in one million by reducing the concentrations of PCB in soils to 1.0 ppm or less. (PP at 5.) This is not correct based on the discussion of risk contained in the document. Please explain how the excess human health risk associated with exposure to PCB can be reduce to less than one in one million by reducing the PCB concentration in the soil to 1ppm or less when the USEPA PRG of .22 ppm corresponds to risk of one-in-one-million?

USACE did not complete a full site specific risk assessment for this site. This is in part because the EPA order mandates the cleanup level. The EPA order is based on an EPA Region 9 preliminary remediation goal (PRG) for determining the need to proceed with site investigation, and is consistent with TSCA. This level is consistent with or lower than the cleanup level for PCBs used by EPA and other federal agencies at many National Priorities List sites throughout the United States. Data indicates the cleanup level will be achieved with the preferred alternative for the final remedial action and that achievement of this level will be protective of human health and the environment for any use of the treated soils. Unfortunately, some of the discussion in the Proposed Plan regarding risk levels is speculative or in error, as pointed out in these comments. USACE believes that the EPA-ordered cleanup level complies with CERCLA and the NCP and is protective.

In addition, the first sentence of page 5 contains a typo: 1 X 10E-4 is not one-in-one-hundred-thousand. It is one-in-ten-thousand.

Correct, the sentence should have read one-in-ten thousand.

Finally, ACE's discussion of the human health risks is incomplete because it focuses on the risk of exposure through contact with the soil, and fails to include the potential for cumulative risk from exposure to other media, or other potential contaminants of concern. It is known that the residents of Tanapag have been in the past and may continue to be exposed to PCB through ingestion of land crabs. In addition, other harmful contaminants have been identified in the Tanapag area as a result of the Fuel Farm Tanks located in the village.

The purpose of this remedial action is to address only the contamination resulting from leakage of Aroclor 1254 from the capacitors placed in the village. While it may be true that there are other contaminants present in Tanapag, the FUDS program is not a general environmental response program such as the Superfund. The Corps may only remediate contaminants that result from eligible former DOD activities. Nonetheless, as a practical matter, any contamination present in the stockpiled soils that is of organic origin such as petroleum residuals from the tank farm will be removed along with the PCBs.

It is not clear what the source of any PCB may have been for any land crabs that were affected. If the PCBs in soils that USACE excavated were a source, it has been removed and the remedial action will ensure a level of cleanup that will prevent any future pathway of exposure to the public.

The stated human health risk of five-in-one-million excess cancer risk does not take these factors into account. ACE should revise this section to reflect more accurately the human health risk associated with the site, or to explain that factors that would affect the risk level were not taken into account.

See above.

5. Alternative 4E: On-Site Treatment by ITD and Off-Site Disposal:

This section contains a discrepancy with the discussion of Alternative 4E in the FFS. The FFS states that the ITD process will result in 400 tons of contaminated residuals. (PP at (FFS at 7-21.) The PP states that 200 tons of PCB contaminated residual from the ITD process will be shipped off the island. (PP at 11.) Is the 200 ton figure a typo? If not, please clarify the discrepancy.

The ITD process will result in 400 tons of contaminated residuals.

III. Interim Draft Treatment Plan: Phase IV Tanapag Village, Island of Saipan, CNMI

As stated in section II(A) of this document, DEQ has requested an extension until August 17, 2001 to provide detailed comments on the Interim Draft Treatment Plan. The comments and questions presented here are based on our initial review of the plan. DEQ reserves the right to submit additional comments at a later date.

Noted.

A. Mechanical Failures and Parts Replacement

Any mechanical system experiences some degree of wear and tear and failure on its component parts. A DEQ staff member discussed this issue with ACE's contractor and asked that the contractor identify specific points of failure expected if the ITD is used. DEQ requests that ACE identify in writing the component parts of the ITD that it expects to experience the most mechanical wear and tear and failure during its operation. Also indicate the frequency that ACE expects that the component part will need to be replaced during regular maintenance.

ECC has extensive experience with operations of the ITD process. It is anticipated that every 1-2 weeks, the system will be stopped in a controlled manner and opened for inspection. Wear rates and items are:

- *Internal flights of the dryer 100,000 tons*
- *Vent Chutes 10,000 tons*
- *Soil conditioner screw auger 15,000 tons*
- *Insulation 50,000 tons*
- *Tipping Valve seats 50,000 tons*
- *Hoses 100,000 tons*
- *Rotary Valves Internal 30,000 tons*
- *Conveyor Belting 20,000 - 50,000 tons*
- *Pump Seals 40,000 tons*

Mechanical failure is not a common cause of down time. Scheduled down time allows the operator to predict failure before it occur. Additional information will be contained in the work plan.

B. Air Emissions During Forced Shut Down

Overall, the draft plan does not sufficiently address air emissions from the ITD unit or the type of control systems and monitoring that will be used to reduce emissions. In order to insure proper control of potential emission concerns, there should be an air-monitoring program in place to test for fugitive emissions and breakthrough of all potential chemicals of concern. A detailed discussion should be added to the draft plan.

DEQ administers Air Pollution Control Regulations that require an air permit for all new emissions sources in the CNMI. DEQ's position is that ACE is required to obtain a local air emission permit to operate the ITD unit in the CNMI.

Furthermore, during forced shut downs, ACE will need to have a plan in place to address the gas emissions generated in the system just before the shutdown. This should also be added to the Draft Treatment Plan.

Although the permit issue is governed by CERCLA section 120, we intend to comply with the substantive standards of all applicable laws and regulations in this remedial action. Please provide us the name of a person in DEQ with whom our contractors and we can work to address CNMI substantive requirements and concerns. At present, the draft treatment plan addresses controls, and its appendix includes modeling calculations for upset conditions. We will add a concise table to the final plan. The ITD system will be operated in compliance with all substantive rules for emissions. Forced shut downs are addressed in the ITD plan (see response paragraph above). The system is shut down in a safe mode when forced outage occurs.

C. Water Usage and Storm Water Control

With respect to water usage, based on ACE's operation parameter, the ITD system will consume roughly 1,200 gallons per treatment hour. Does this estimate account for any additional water the system will consume during startup after a planned or forced shutdown? If not, how much additional water will be needed for startup events?

Cemetery 2, the proposed site of the ITD unit is a flood prone area. The draft plan must include erosion control measures and a storm water management plan for the operation site to address this issue. The plan should consider the likelihood of heavy rains and typhoon conditions. DEQ administers an Earthmoving and Erosion Control program that requires permits for all earthmoving activities. Approval of a particular activity is contingent on the approval of a storm water management and erosion control plan by DEQ's engineering staff. ACE should obtain a local earthmoving permit. At the very least, ACE must comply with the substantive requirements of DEQ's regulations.

The estimated water consumption includes water consumed during shut downs and startup. The project will comply with applicable and substantive earthmoving, storm water, and erosion control requirements. Again, we appreciate DEQ's continuing cooperation and support and we request a DEQ point of contact with whom to work.

Please see our responses to EPA related to these issues.

D. Material Safety Data Sheet

An MSDS for the biocide ACE proposes to use in the ITD process should be provided to DEQ prior to use in the remediation. Appendix B does not have the report on the biocide.

ECC will provide an MSDS for biocide in the revised report.

E. Alternative Mainland Disposal Site

The Interim Draft Plan indicates on page 5 that if the identified and approved facility in Utah ceases to accept the 400 tons of residual PCB, ACE will locate an approved and permitted alternate facility for disposal. This alternative facility should be identified and secured now to avoid unnecessary delay during which the concentrated PCB waste is stored in Tanapag while an alternate facility is identified if a problem occurs.

Please refer to Traffic and Transportation Plan and response to comment #6 on page 3. Multiple sites will be set up to receive the residual wastes in case of unexpected obstacles.

F. Plan to Dispose of Certain Debris at Puerto Rico Dump

Under the Interim Draft Traffic and Transportation Plan, page 1, ACE should describe how it plans to determine which waste is non-hazardous considering that all of the existing debris under the poly liner covers is in contact with the contaminated soil.

We will not send contaminated debris to the Puerto Rico dumpsite. All debris will be sent to the mainland for disposal. The hazardous nature of the debris will be determined based on direct *contact with contaminants. Soil profiling will be completed and compared to the facility acceptance criteria to determine which facility will accept the waste*

G. <u>Training for Local Workers</u>

The plan states that ACE plans to hire 15-20 local unskilled and skilled workers from the island. Will these people need to be trained and certified in order to work within the hazardous condition area?

It is currently planned that some site workers from past ECC activities will be hired for this phase of work; additional labor will be acquired. The workers will be trained in 40 hr OSHA HAZWOPER, as well as on-site training for treatment and site operations.

3.3 RESPONSE TO THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS (CNMI) DEPARTMENT OF PUBLIC HEALTH COMMENTS ON THE FEASIBILITY STUDY AND PROPOSED PLAN FOR REMEDIATION OF PCB CONTAMINATED SOILS AT TANAPAG VILLAGE, SAIPAN, CNMI.

This letter is to reiterate the position of the CNMI Department of Public Health regarding the proposed treatment methodologies for PCB-tainted soil in Tanapag Village. Of course, the Department is not in a position to critically evaluate the various engineer proposals regarding the treatment and/or shipping of the soil. Our major concern relates to the current health and well being of the Tanapag villagers. As always, our focus has been to protect the villagers from additional exposure to PCB's as well as other toxic materials present in the soil. In light of this, DPH strongly advises that any on-site treatment method must include appropriate monitoring for Dioxin, PCB's and POC's in the process emissions during the soil treatment process, as well as thorough sampling of Dioxin, PCBs, and metals in the treated soil. These sampling results must be made before any treated soil is returned to the village. These recommendations are made to avoid any additional exposure to hazardous compounds that may have been only partially treated, as well as those compounds that may have been created in the treatment process.

The Corps' preferred remedy is treatment of the 20,000 tons of PCB contaminated soil with indirect thermal desorption technology (ITD) followed by shipment of the residual filter cake (about 400 tons) off island. The Corps and its contractor ECC have been implementing federal Clean Air Act standards in preparing for the treatment process, since the unit produces process vapor. The vapor will be measured before it is emitted, and any emissions will comply with federal Clean Air Act standards or CNMI standards if they are applicable, or if not applicable, if they are technically feasible to achieve.

The ITD process will successfully remove organic carbon, PAHs, chlorobenzene and any other organic material that may be found in the stockpiled soils. The process will not remove metals such as copper, arsenic, or cadmium. However, these metals and organic compounds are not generally found in association with PCB capacitors and are not among the contaminants of concern for this remedial action. We will sample and test the treated soils for compliance with the cleanup criteria for PCB and to determine if hazardous wastes are present before placement. We will include the type of testing we propose to do in the workplan for review and discussion with DEQ and EPA.

3.4 RESPONSES TO USEPA'S COMMENTS ON THE FOCUSED FEASIBILITY STUDY AND PROPOSED PLAN FOR REMEDIATION OF PCB CONTAMINATED SOILS AT TANAPAG VILLAGE, SAIPAN, COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS.

1. At this time, EPA cannot approve the preferred alternative identified in the PP. It is unclear to EPA whether a final FFS or PP will be prepared. EPA is less concerned with the preparation of a final FFS and more interested in the Army providing adequate and appropriate responses to EPA and public comments. EPA is also anticipating submission of a recommendation for treatment and disposal remedy from the Army, to be evaluated for approval according to Section VIII. 1.B. of the AO.

   The U.S. Army Corps of Engineers (Corps or COE) intends to submit a letter requesting approval of our remedy selection to EPA in accordance with the RCRA 7003 administrative order. We will attach a responsiveness summary, which will address all substantive comments received on the proposed plan, and FFS, including those received from the public and the DEQ. We also plan to attach our draft ROD that will be staffed through DA channels for approval under DERP FUDS.

2. It would have been helpful to have a summary and/or conclusion section for the FFS and PP in order to focus the reader on the purpose and conclusions of the report and next steps in the process. At this point, the Army needs to clarify the process for remedy selection and approval, indicating that the Army recommends the proposed alternative and EPA approves pursuant to the AO. As written, the Army states that both the Army and EPA are selecting the remedy. To date, EPA has not been involved in the preparation of the FFS, PP or remedy selection. (PP, Introduction, page 1, line 9.) EPA requests that a process and associated schedule for remedy selection and implementation be submitted.

   The remedy selection request (RCRA) / ROD (FUDS) will contain a summary of the process for remedy selection and execution. The remaining tasks, some of which may be performed simultaneously and not necessarily in this order, are:

   - Address and review responses to comments received to date with the EPA
   - Complete remedy selection request for EPA approval.
   - Complete and submit ROD to HQDA for approval
   - Release final decision to public
   - Prepare remedial design for any necessary elements of final remedy
   - Coordination meeting for Work Plan with EPA, ACE, ECC.
   - Final Draft Work Plan submitted for approval.
   - Mobilize to Saipan.
   - Ship Treatment equipment to Saipan; assemble equipment and prepare equipment for operation.
   - Conduct remedial action in consultation with EPA and CNMI until remediation goals are achieved

- Provide data to demonstrate completion to EPA, CNMI and the public
- Propose close out of project upon completion to EPA for approval
- Close out project.

3. EPA has concerns with some of the basic objectives of the FFS, which appear to impact the evaluation of the alternatives presented in the study. While we understand that the AO specifies treatment of the soil, EPA explained in correspondence to Helene Takemoto on Apri120, 2001 that the FFS should evaluate transportation, treatment and/or disposal alternatives for the PCB contaminated soil. EPA 's goal, which should be consistent with the Army's objectives, is to ensure that all soils identified to contain over 1 mg/kg PCB are properly treated and/or disposed of in a manner that complies with existing laws and regulations and protective of human health and the environment. The AO specification of treatment should not be used as a rationale to dismiss an alternative, since the AO allows for the proposing of an alternative methodology in Section VIII.l.8 . The Army needs to provide adequate analysis of the alternatives in the FFS. Statements such as the "alternative is contrary to the FFS preference for on-site treatment and the USEPA preference for permanent destruction of the PCBs" are unsupported. Provide supporting references and/or documentation or remove these statements from the FFS and PP.

   The Corps has only considered technologies or solutions that would achieve treatment or disposal of soils contaminated with PCBs over 1 ppm. The FSS documents the rational for selecting for selecting the technology preferred in the proposed plan. The proposed plan was published to solicit public comment on the Corps' proposed alternative. These comments have been received and will be addressed in the responsiveness summary. Preferences for an onsite rather than offsite remedy and for treatment to reduce the toxicity, mobility, and volume of the contaminated material are expressed in the NCP and CERCLA.

4. Since CNMI and community acceptances are not covered in the FFS or PP, provide information on these criteria.

Reference the NCP, Sections 300.430(e)(9)(iii)(H) and (I), and 300.430(f)(3). CNMI and community' acceptance were captured through public comments. These comments will be included in the responsiveness summary attached to the remedy selection / ROD document. The criteria for addressing comments were presented at the July 11, 2001 public meeting by LTC Light. The Corps continues to communicate and address issues relating to implementation of the plan. The Corps has an in-place community relations plan to address on going comments. As the remedial action is implemented, USACE will continue to provide information on the remedy to CNMI and the public.

5. Although not covered in the FFS and PP, prior to granting approval on a final remedy, ACE needs to provide more information on the location of the proposed treatment/disposal alternative. EPA requests for ACE to conduct and submit an investigation of site alternatives in the event that a treatment system or on-island disposal remedy is recommended by ACE. This investigation should include at least four potential locations and address the feasibility of each site.

   We have evaluated three locations for siting the treatment system: Marpi, the DPW lower base yard, and the cemetery 2 site. The cemetery 2 site is preferred since its use eliminates spill risk and is the most cost effective. In addition, use of that site creates less public safety hazard related to traffic, presents no residential exposure during remediation, offers the availability of adequate utilities, and is currently available to USACE under an access agreement. The remedial design will establish the *final details concerning the location, preparation and implementation of the work at the remedial action site.*

The Marpi site is less feasible than the cemetery site because it is too remote. The closest utilities, i.e., water, electricity, and telephone, are located one half mile away from the Marpi site. There are also several thousand yards of dredged material stockpiled on site. Excessive time and cost would be required to develop the site to use the ITD unit. Use of the Marpi site would also require trucking all of the contaminated soils from the current storage area, which poses safety and logistical hazards.

The DPW lower base yard site was not chosen primarily because of heavy foot traffic and local use of the nearby area. Many people are present near this site every day and much commercial and government activity is ongoing in close proximity to it. The haul routes from cemetery 2, where the stockpiles are located, to the lower base yard, are inadequate for the project purpose. The road is partially paved, contains numerous potholes, and floods during heavy rains.

We looked for but could not identify a fourth site that met the project needs.

6. In order to adequately assess the alternative presented in the FFS and PP, characterization of the soil/waste streams to be treated and/or disposed is necessary. There is no information on PCB concentration of the soils, any other possible contaminants or a characterization of the matrix. PCB soil concentration may effect treatment/disposal alternatives. Analytical sampling of soil stockpiles provided to EPA separately is inadequate for consideration of treatment technologies. Also, without knowing parameters such as particle size distribution, TOC, BTU value, % moisture etc. and some idea about how homogeneous these values are it is difficult to properly evaluate alternatives. Provide a more complete discussion of soils/waste streams and include in the assessment of the various alternatives.

   Specified parameters were assumed as 7% fines, 18% moisture, 300 BTUs per pound, and 5,000 ppm TOC for all technologies evaluated. Available data from the removal actions provided adequate information for the alternatives analysis presented in the proposed plan and FFS. The Corps believes that these values are consistent with the site conditions. Soil characterization was adequate to evaluate the alternatives and to support selection of the proposed remedy. Chemical characterization of the PCBs was adequate for evaluation of the alternatives. Any additional data will be used to refine the remedial process rather than for remedy selection. If the basic performance criteria of attaining 1 ppm residual PCB could not be met by an alternative technology, additional data was not and will not be sought to further evaluate that alternative because it does not satisfy the cleanup criteria on its face.

   We used TCLP, a standard test to determine whether a media is hazardous waste, to test the stockpiles. We consider TLCP to be adequate to do our baseline survey of the stockpiles. The results of the TCLP demonstrate that the stockpiled soil has no leaching metals and therefore is not hazardous waste. We agree that we need to perform additional testing of the stockpiles to identify any contaminants that may need to be considered and tested for during the POP test. As discussed between EPA and the COE, we will perform this additional stockpile testing prior to operation of the ITD unit.

7. In general, the document lacks a discussion of sampling of the soil and/or residuals. Although the details of such sampling would be reserved for a work plan, each alternative evaluated has differing levels of analytical requirements, which relate to implementability and cost. Provide a discussion and accompanying cost estimates for analytical requirements associated with each alternative retained for evaluation.

The Corps considered analytical costs in determining the treatment alternative cost estimates. See FFS table 2.

8. EPA is concerned with the effort put forth by the Army for evaluation of technologies which have not been proven effective, while other technologies which are more promising have either not been evaluated (e.g., thermal well) or discarded from consideration for unsound rationale (e.g., BCD, SET). EPA requests for the Army to adequately evaluate these alternatives prior to making a treatment/disposal recommendation to EPA.

The Corps considered technologies according to the effectiveness of treating PCB contamination, implementability, and cost. BCD and SET technologies were evaluated following this standard rationale, which justified their elimination from further consideration. Research into these technologies included past project data and vendor literature. The Corps is not aware of proven cases that show thermal wells to have been used on excavated soils, and that they achieved the 1 ppm PCBs standard.

Our general response to DEQ's general comment, and specific response to DEQ's specific comment on BCD, is reprinted as follows:

The four chemical processes that were considered for treatment of the ITD residuals were rejected because it has not been demonstrated that these methods are capable of destroying PCBs to meet the remediation goal. The purpose of a focused feasibility study is to limit the comparative analysis of alternatives to those alternatives that have successfully achieved commercial application in the marketplace, not to conduct production level pilot tests of the type necessary to establish whether the post ITD treatment method will meet the remediation objective.

Base-Catalyzed Dechlorination (BCD) is very effective for PCB contaminated liquids but will not be effective on the filter cake that is the residual from the ITD process. Application of the BCD process to the filter cake may increase the volume of the filter cake by a factor of ten. This will result in 4000 ton of residual material that must be disposed of rather than 400 tons. Additionally, the BCD treated residuals will be very oily and asphaltic and unsuitable for disposal on Saipan. If this material cannot be disposed of on Saipan it will require transportation and disposal on the Mainland.

Use of the BCD process will require a pilot study performed in Saipan on the residuals from the ITD process applied to the stockpiled soil to insure that the 1 ppm remediation object can be met. In summary, Alternative 4D was rejected, as were the other three options that proposed a chemical treatment process be applied to the 400 tons of ITD residuals, because none of the chemical treatment methods have been pilot tested. It makes no economic sense to propose a treatment method, which must be pilot tested in Saipan, before it can be utilized. The cost of conducting a pilot test in Saipan, the extra time required to conduct the test, combined with the very real potential for the test to fail, make the application of BCD unacceptable from a cost and timeliness perspective.

The single biggest impediment to using these technologies is that they are not compatible with this ITD unit and they would not effectively deal with the process byproducts. Neither SET nor BCD has achieved 1 ppm for remediation of PCBs in the type of soil or matrix found at Tanapag Village.

For these reasons, these technologies are not protective of human health and the environment, and do not meet the ARARS. Since they fail the two threshold criteria under the National Contingency Plan (NCP) and CERCLA, we eliminated them from further consideration.

9. The FFS does not appear to address mobilization costs and shipment of hazardous and non-hazardous materials to Saipan. Clarify and provide information on mobilization and transportation of cargo to Saipan.

   The ACE contractor prepared the cost estimates, which included shipment costs. This information was factored into the cost estimates of alternatives, which was included in the summary cost estimate table in the FS. See FFS Table 2.

SPECIFIC COMMENTS OF FOCUSED FEASIBILITY STUDY

A FFS Section 2.2, Surplus Electrical Equipment, page 2-1 and PP Site Background, page 2, third paragraph: EPA ' s TAT did not actually remove the capacitors but provided technical assistance to DEQ. It was DEQ who did the actual removal. Also, the two capacitors were removed from the village in 1989.

Noted. The available records from the 1988 to 1990 discovery of capacitors on the Island and subsequent response actions are incomplete and not clear as to the origin, location, or condition of all the capacitors, or precisely which entity took which actions. If EPA has historic records providing further evidence of the details of these activities, we request that they be furnished to USACE and we will add them to the Administrative Record file for the project.

B FFS Section 4.2, ARARs, page 4-1 and Chapters 7 & 8, compliance with ARARs evaluations: The list of ARARs is incomplete. Not all federal and CNMI ARARs were identified by the Army. Not an (sic) TSCA requirements were identified. Location, chemical and media specific ARARs were not identified.

B.1 All ARARs associated with the evaluated alternatives should be included. In general, the lack of complete identification of all ARARs may compromise a complete and correct evaluation/comparative analysis of alternatives. Provide a more complete identification of alternatives so that a more credible evaluation/comparative analysis of alternatives may be conducted. If an ARAR is applicable to a specific alternative, so state. Also, provide a more detailed discussion of compliance with ARARs in the evaluation of each alternative.

The Corps evaluated chemical, location, and action specific ARARS for PCB contaminants. We did not identify any chemical or location specific ARARS but we identified TSCA as an action specific ARAR at section 4.2 of the FFS. The EPA Order does not identify any other specific sections of laws or regulations that are applicable to the work, and it does include a specific cleanup goal for the remedial action. USACE believes we have satisfied the requirements of Section 121 of CERCLA regarding identification of ARARs for the purpose of our FUDS/CERCLA action.

This remedial project will comply with the substantive standards of all laws and regulations that apply (i.e., are enforceable) to work done on it. During the onsite work, we will comply with substantive standards promulgated under the Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, and the Occupational Safety and Health Act.

Once the project work moves off site, we will comply procedurally and substantively with Department of Transportation regulations, the Resource Conservation and Recovery Act requirements applicable to the PCB contaminated residuals, and any other statutory or regulatory requirement applicable to this remedial action.

Our contractor is working closely with the CNMI DEQ to assure that we understand CNMI substantive standards. We will meet these standards, even if not enforceable against the United States, if technically feasible. For example, pursuant to consultation among ECC, the CNMI Commonwealth Utilities Commission (CUC), and the DEQ, it appears it will be necessary to install a well to draw brackish water from the tidal aquifer in order to operate the ITD unit. Use of this non-potable water will avoid an adverse impact on the community's drinking water supply. ECC is working with DEQ to provide DEQ the information required in the CNMI well development process and to install the well in compliance with CNMI standards, as long as these are reasonable and technically feasible. ECC advises the Corps that its consultation thus far with the DEQ on this issue has been productive and reasonable, and has reported no technical concerns in complying with CNMI's well development standards.

The project will comply with applicable Clean Water Act standards.

Water is involved in the treatment process. Some of that water will be in contact with the PCBs and will become contaminated. This contact water will be polished with activated carbon to remove impurities. After the contact water is cleaned, it will be used to re-hydrate the treated soils to the same moisture content present before treatment. This water will not be released to a surface water body. The non-contact water will be used to cool the contact water through a metal heat exchanger in a way to prevent the two types of water from touching each other. The non-contact water is clean, but the level of dissolved salt is higher. This water may be discharged through a discharge drain periodically, and when discharged it will recharge the brackish aquifer. It will not be discharged to a sewer system or publicly owned treatment works. ECC is working with the DEQ to assure that this discharge complies with any applicable federal NPDES standards, and with technically feasible and reasonable CNMI equivalent standards. Again, ECC has not indicated any impediment to achieving compliance with CNMI equivalent standards.

With regard to air emissions from the ITD unit, ECC has been implementing federal Clean Air Act standards in preparing for the treatment process, since the unit produces process vapor. The vapor will be measured before it is emitted. The CNMI has not yet identified or cited CNMI clean air standards in its comments on the proposed plan; however to the extent these exist and apply, we will comply with them in the ITD treatment process. If they are not strictly enforceable, we will work with DEQ to meet these standards if technically feasible.

We are also working with DEQ to address their concerns and meet the technically feasible requirements of the CNMI's earthmoving and erosion control programs. DEQ worked with us during the removal action and the construction of the stockpile cells and berms to inform us about local site conditions and to identify and address CNMI concerns in these areas. We believe that DEQ and the Corps and its contractors are committed continuing to this cooperative effort through the remedial phase of this project.

We agree that substantive compliance with the applicable standards of the federal statutes discussed above is required. However, the requirement for substantive compliance with these standards does not make these standards ARARS. The designation of ARARS creates enforceable legal obligations under CERCLA Section 310; ARARS should not be identified unless clearly appropriate.

Reference CERCLA 121(d), 40 CFR 300.400(g) and 300.515(d)(1) and (h)(1). The only chemical or constituent of concern (COC) is PCB 1254, although the treatment process we have selected for approval will reduce all PCBs that may be present in the soil to below 1 ppm. CERCLA 121(d) states that the purpose of ARARS is to address the "degree of cleanup" for the hazardous substance of concern when it will remain on site at a level above the pre-release conditions. The ARARS must pertain to a specific COC or to the circumstances of its release. It must be a federal environmental statute, a more stringent state environmental or siting law, or a promulgated regulation that is legally applicable or relevant and appropriate to the circumstances of the release.

The Tanapag PCB cleanup involves the hazardous substance PCB 1254 and the circumstance of its release is spills from transformers into the soil. TSCA regulations establish standards for responses to releases of PCBs to soils. We have used an EPA directed cleanup level that exceeds TSCA levels for soil excavation. We are using an EPA directed treatment standard for the treatment end product that meets or exceeds TSCA standards. We have identified the TSCA standards as the ARARS.

C FFS Section 6.1, General Description of the Technology Types, Soils Washing, page 6-2: While EPA agrees that this method may not be effective for treatment of PCBs due to the lack of solubility of PCB in water, this discussion does not adequately describe the issues with this technology. The reasoning used to eliminate soils washing could have just as easily be applied to thermal desorption residuals. Provide an adequate and appropriate explanation for the removal of this method as an alternative, or present an evaluation of this alternative.

PCBs are not soluble in water; therefore, PCBs are not readily removed from soil through soil washing with water. Treatment of residual soil using soil washing will not achieve the 1-mg/kg cleanup level. For this reason, soil washing was eliminated in the initial screening as not effective.

D FFS Section 6.1, General Description of the Technology Types, Solidification/Stabilization, page 6-2: As in the method discussed above, the rationale for elimination of this alternative is inconsistent and/or incomplete. It is unclear why the technology is dismissed if it effectively reduces mobility and bioavailability. The rationale that it doesn't comply with the "treatment standard" because contaminant mass is not reduced nor PCBs destroyed, could apply to the off-site shipment method as well. Provide an adequate and appropriate explanation for the removal of this method as an alternative, or present an evaluation of this alternative.

This process would effectively stabilize the material but would increase the volume at least 30 - 60 percent. Dilution is not an appropriate technology for treatment of TSCA regulated contaminants. This process is contrary to the ARAR and was therefore eliminated from further consideration as a remedial alternative.

E FFS Section 6.1, General Description of the Technology Types, Solvent Extraction, page 6-2: It is unclear to EPA why the Army states that mass reduction is required as an ARAR, especially since the only ARAR listed in the FFS was 40 CFR 761.61. Provide an adequate and appropriate explanation for the removal of this method as an alternative, or present an evaluation of this alternative

The paragraph should have read that this alternative does not meet the statutory preference for reduction of volume. However, ACE eliminated solvent extraction because of the uncertainty of the technology to meet the cleanup objective of 1ppm. Further, this alternative is cost prohibitive.

F FFS Section 7.1, Evaluation Criteria, page 7-1: It is unclear why the 5th paragraph regarding the specifics of shipping of PCB-contaminated materials is included in the section on evaluation criteria. Please clarify

Shipping costs are relevant to cost considerations. The Covenant between the US and the Commonwealth of the Northern Mariana Islands specifies federal law that applies to US agencies implementing federal actions in the CNMI. Section 502(b) of the Covenant provides:

(b) The laws of the United States regarding coastal shipments and the conditions of employment, including the wages and hours of employees, will apply to the activities of the United States Government and its contractors in the Northern Mariana Islands.

Therefore, when an agency of the United States conducts a US activity in the CNMI that is funded with US dollars, the US coastal shipping laws apply. This shipping-related requirement needs to be retained in the analysis because it is important for the evaluation of cost and implementability of some of the alternatives.

G FFS Section 7.2, Detailed Analysis of Alternatives, 7.2.1 Alternative 1: No Action, pages 7-2&3 and PP Remedial Alternatives, Alternative 1: No Action, page 6: EP A believes that this alternative may be consistent with 40 CFR 761.61(a)(4) and would require this alternative to meet the requirements of TSCA, 40 CFR 761.61(a)(7) and (8). Monitoring, maintenance and associated costs needs to meet these requirements. Revise this evaluation accordingly. Clarify why the Army does not believe that this alternative meets TSCA.

The NCP at 300.430(e)(6) mandates the evaluation of the no action alternative in the FS process as a baseline. Because the materials had already been excavated under the time critical removal action and placed in a temporary storage area not intended for permanent disposal, a true no action alternative was no longer viable. Simply leaving the temporary storage area with materials that exceed the limits of the EPA order is not acceptable to USACE, and presumably also not to EPA. The no-action alternative we discussed in the FFS was not a true no action alternative. We should have discussed a no cost, no action alternative rather than No Action with institutional controls. We evaluated off site encapsulation rather than on site encapsulation for the encapsulation alternative because the community has always and consistently required that the contamination be removed from their village. Further, there are tsunami inundation and project size constraints associated with an on site encapsulation alternative that eliminated it from consideration.

H FFS Section 7.2, Detailed Analysis of Alternatives, 7.2.2 Alternative 2A: Off Site Disposal, pages 7-4&5 and PP Remedial Alternatives, Alternative 2A, page 7: In general, due to limited information provided, it was difficult to conduct a complete evaluation of this alternative. Although we realize that an FFS is not meant to provide a detailed work plan, since the off -site transportation and disposal of PCB-contaminated material is involved in two of the evaluated alternatives, including the preferred alternative, EPA is interested in having more information prior to making a decision on the Site remedy.

Issues necessary to resolve which could present barriers to implementation of the alternative or impact the estimated costs are the importation of soils outside of the continental U.S. and the storage capacity and storage regulations for PCB-waste at the interim holding facility in Guam. For instance, the following issues need to be considered:

i) The USDA requires that the party receiving soil from outside the continental U.S. obtain certification from the USDA allowing them to do so. This certification must be obtained prior to shipment of soils; a copy of the certification must accompany every shipment. This requirement needs to be addressed in the evaluation of this alternative. The lack of certification could disbar some potential disposal facilities from accepting the waste and impact disposal cost. Clarify whether the facility(s) being considered for disposal of PCB-contaminated soils have USDA certification to receive soils from outside the continental U.S.

ii) The FFS states that the contaminated material would be shipped weekly to Guam and stored until shipped out on a monthly basis to the U.S. mainland. There are no detailed descriptions of any requirements, costs, procedures for shipping, storing, and transferring the soil as it enters Guam. It is not clear if the Government of Guam has been consulted with respect to the issue of allowing PCBs to be transported through its territory. Lack of consultation may result in Government of Guam refusal of the transport/transfer of PCB contaminated soils through its territory. Another potentially problematic issue is the storage capacity at or near the receiving/transfer port in Guam for waste pending trans-shipment to the U.S. Also, the regulations governing conditions and permissible length of storage need to be addressed. These items could significantly impact the process and cost of shipping the waste from Saipan. Provide a more detailed description of the aforementioned issues.

iii) As there is no breakout of the portion of transportation allocated to sea versus land shipping segments it is difficult to evaluate this line item. A major variable that could impact this line item is costs associated with off -loading, storing, and re-lading the waste in Guam pending shipment to the U.S. Clarify whether cost estimates are inclusive of all routes of transportation and temporary storage of material.

The logistical difficulties with shipping 20,000 tons of PCB contaminated soil are very significant. We would need to barge about 1500 containers of contaminated soils from Saipan to Guam. The Guam EPA has indicated in its comments on this project's FFS and proposed plan that it is not amenable to the prospect of addressing the management, handling, and storage of this quantity of contaminated soil on Guam or in its harbor facilities. We would need to obtain the necessary Guam permits to transit these soils through Guam. In fact, because of the quantities of soil and the time involved, we would need to obtain a TSCA storage facility on Guam.

If we could surmount the substantial problems with bringing this material through Guam, we would ship the soil to the US mainland for final disposal. Obtaining permits and permission to bring this quantity of soil into a US mainland port would also be difficult, in *part because of the sheer quantity of the soils. In addition to working out consent to enter a port, we would need to obtain a US Department of Agriculture permit to bring the soils into the US. This would require a significant testing effort and protocol to assure the USDA that the soils did not contain prohibited microorganisms or other threats to US agriculture. In addition to the USDA requirements, once we sent this material off the Tanapag site, we must test each container (say 1500 containers) in accordance with DOT regulations. If the material tests less than 50 ppm, we would send it to RCRA permitted landfill. If it tests above 50 ppm, we would have to send it to a very costly TSCA permitted landfill.*

For all of these reasons, the shipping logistics between Saipan and Guam and Guam and the US mainland would be very time consuming and costly to work out. This alternative would require much more funding that we have or than we may be able to obtain through the FUDS program. It would also take an unreasonable amount of time to execute this alternative.

I FFS Section 7.2, Detailed Analysis of Alternatives, 7.2.3 Alternative 2B: Off Site Encapsulation, pages 7-6 thru 9 and PP Remedial Alternatives, Alternative 2B: Off-Site Encapsulation with Stabilization, page 7:

i) Implementability (FFS, page 7-8): Provide a map with the location and dimensions of the "area once occupied by Naval Operating Base, Tanapag, Aviation Gasoline Tank".

ii) If there are CNMI permitting requirements, they should be mentioned in the section on ARARs.

iii) It is unclear why compliance with the AO schedule is mentioned for this alternative since it appears that none of the alternatives will be able to meet the schedule of the current AO.

iv) Cost, page 7-8: What is the time period assumed for O&M costs?

v) PP text says "if a suitable site can be located on site." This should be "on island" not "on site". Correct this mistake in all appropriate locations

A map with locations and dimensions is not necessary for this document. CERCLA governs the permitting requirements or lack of them; our opinion on the non-applicability of the CNMI regulations has been transmitted to the CNMI government. Concur that reference to the AO schedule should not have been made. O&M costs assume a 30-year period. We intended the term "on site" to accord with CERCLA.

The reference to the former Tanapag Naval Operating Base area was speculative and should have been omitted. In fact, the FFS stated that "(t)here may be suitable locations elsewhere in Saipan as well."

Please see the response to Specific Comment B. above.

J FFS Section 7.2, Detailed Analysis of Alternatives, 7.2.4 Alternative 3A: On-Site Treatment by Thermal Blanket and Thermal Oxidation, pages 7-9 thru II and PP Remedial

Alternatives, Alternative 3A: On-Site Treatment by Thermal Blanket and Thermal Oxidation, page 7-8:

i) What is the estimate of PCB contaminated material that will need to be disposed of utilizing this alternative?

ii) Reduction of toxicity, mobility or volume, page 7-10: The FFS states that the "process successfully treated 1,181 tons of PCB contaminated soils from an initial concentration of 10,000 ppm to I ppm. i, Review of the Final Project Report , Phase II, Sept. 22, 1999, Page 40-41 indicates the 1,181 tons included soil treated to less than 10 ppm but greater than 1 ppm. The report States "A total of 1,181.20 tons of contaminated soil were treated utilizing the thermal desorption system. However, three soil batches (batches 21 through 23) contained PCB contamination greater 10 ppm..." Clarify these discrepancies.

In addition, the discussion of the thermal blanket technology neglected the problems associated with implementing the alternative due to its large electricity power requirements, frequency of brownouts on the island and issues with high humidity and moisture. The Phase II Report indicates that "the slow progress of the thermal blanketing technique was considered incompatible with the project's scheduling constraints...off-site (disposal) was chosen as the preferred remediation method to complete the project". The discussion needs to be revised to provide a more complete evaluation of this alternative.

An estimated one-percent of the total volume of soil will be disposed of as PCB contaminated waste. The Corps will review the discrepancies. The thermal blanket process was able to achieve the performance standard of 1 ppm. The Corps agrees that the slow progress of the technology was the reason for the off-site disposal decision. The price of treatment reflects the slow process and is significantly higher than was contracted for during Phase II of the project.

6A. FFS Section 7.2, Detailed Analysis of Alternatives, 7.2.5 Alternative 3B: On-Site Treatment by Incineration, pages 7-11 and 12 and PP Remedial Alternatives, Alternative 3B: On-Site Treatment by Incineration, page 8: Production and control of dioxin/furans needs to be included in the evaluation of this alternative.

TSCA is the ARAR and defines emission controls for incineration of PCB contaminated materials. Controls for dioxins/furans are achievable under normal operations, which are expected.

Page 6. B. FFS Section 7.2, Detailed Analysis of Alternatives, 7.2.6 Alternative 4A: On-Site Treatment by Indirect Thermal Desorption and PCB Destruction by Fenton's Reaction, pages 7-12 and PP Remedial Alternatives, Alternative 3B: On-Site Treatment by Indirect Thermal Desorption and PCB Destruction by Fenton's Reaction, page 8-9: Clarify the final status of the Fenton's Reaction alternative. The documents seem to contradict itself in that it dropped Fenton's as an onsite alternative, but said it should still be retained as an option to offsite disposal of Indirect Thermal Desorption residuals if future bench scale test can be shown to work. Is there a plan for bench scale testing of Fenton's? Clarify.

We have eliminated Fenton's Reaction as an alternative because we have not been able to determine that it is implementable, effective, or cost effective. Off-island shipment of the treated residuals that exceed the cleanup criteria is still the preferred alternative.

Page 6. C. FFS Section 7.2, Detailed Analysis of Alternatives, 7.2.6 Alternative 4B: On-Site Treatment by ITD and PCB Destruction by Solvated Electron Technology, pages 7-15 thru 17 and PP Remedial Alternatives, Alternative 4B: On-Site Treatment by ITD and PCB Destruction by Solvated Electron Technology, page 9: If the feed rate is typically less than one ton of material per day, and there is approximately 400 tons of treated material generated for destruction, it is unclear how this action will be completed in 3-6 months. Clarify and correct this discussion.

Noted. At the project rate of production of the SET system, treatment of 400 tons would take about 15 months.

Page 6. D. FFS Section 7.2, Detailed Analysis of Alternatives, 7.2.10 Alternative 4E: On-Site Treatment by ITD and Off-Site Disposal, pages 7-21 thru 23 and PP Remedial Alternatives, Alternative 4E: On-Site Treatment by ITD and Off-Site Disposal, page 11: See discussion provided for Alternative 2A.

i. USDA requirements are not applicable to filter cake from the ITD as this is an industrial process residue that has undergone thermal treatment at 900 degrees Fahrenheit.

ii. The transportation plan addresses these issues.

iii. We will be shipping 400 tons of filter cake rather than 20,000 tons of contaminated soils.

Page 6.E. FFS Section 7.3, Alternatives Retained for Comparative Analysis, page 7-23: The AO requires that USACE "perform a laboratory scale investigation of the feasibility and practicability of using Fenton's Reaction in Saipan." This was based on a determination by EPA that Fenton's Reaction has not been demonstrated to be an effective technology for treating PCBs. The AO does not require other treatment processes as explained in the FFS. Therefore, the rationale for discarding Alternatives 3A, 4B, 4C, or 4D based on the fact that USACE has not performed laboratory testing is unsupported. Alternative 3A had been utilized in Saipan with limited success and would therefore not be recommended to retain as an alternative. Clarify why the Army believes that the processes for alternatives 4B, 4C and 4D have not been proven to be capable of achieving the treatment standard. For processes which have been proven to meet the treatment standard, conduct comparative analysis.

Treatment processes attached to the ITD need to be performed with the matrix created by the ITD. This matrix is a wet solid with high organic matter. The processes that were evaluated focused on the processes' abilities to manage this waste matrix. Experiences in managing this matrix were also evaluated. The comparative analysis in the FFS did address the performance issue. We agree that we do not have data on Fenton's Reaction, see item B above. We do not have data on the four alternatives cited and therefore we eliminated them from further consideration.

Page 6. F. PP Summary of Site Risks, page 4-5: This entire section could benefit from editing. Correct errors and provide clarification of information.

PP Summary of Site Risks, Human Health Risks, page 5, first sentence: 1 x 10-4 corresponds to a one in ten thousand risk, not one in one hundred thousand. PP Summary of Site Risks, Human Health Risks, page 5, end of second paragraph; Concentration and risk are proportional, but are they linear? A risk of one in a million from soil concentrations of

0.22 ppm does not necessarily mean that soil concentrations of 1 ppm yield a risk of five in a million. Clarify.

Noted. Addressed in our responses to DEQ's comments.

3.5 RESPONSE TO THE GUAM ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE FOCUSED FEASIBILITY STUDY AND PROPOSED PLAN FOR REMEDIATION OF THE PCB CONTAMINATED SOILS AT THE TANAPAG VILLAGE, SAIPAN, CNMI.

A number of proposed alternatives require transshipment and short-term storage of PCB contaminated soil and/or filter cake on Guam. Any such actions will require a permit and permission from our Agency. At the present time, Guam EPA has insufficient information on what the Corps' detailed plans are to confidently say whether we would permit such actions. We do not believe that associated costs and risks during storage on Guam were factored into the comparative analysis of options. We would insist on having this done. Other options, such as hiring a U.S. flag carrier for direct CNMI to the U.S.-mainland shipment should be evaluated in light of our concerns.

We agree that the logistical difficulties with shipping 20,000 tons of PCB contaminated soils from Saipan through Guam to the US Mainland are substantial and significant. This is not a viable alternative and we have dismissed it.

The recommended remedy involves treatment of the contaminated soil on Saipan to reduce the quantity to 400 tons of filter cake, which will be contaminated and will require transportation to the US mainland through Guam. We will comply with all US Department of Transportation regulations and with the applicable requirements of the Guam Government. We would appreciate being provided a contact person in GEPA to help us work through the issues involved in executing this remedial action, insofar as it may involve transit through Guam.

For current information on the remedial action, please refer to the revised draft Interim Draft traffic and Transportation Plan, August 2001, enclosed.

3.6 RESPONSES TO THE PUBLIC MEETING COMMENTS ON THE FOCUSED FEASIBILITY STUDY AND PROPOSED TREATMENT PLAN FOR REMEDIATION OF THE PCB CONTAMINATED SOILS AT THE TANAPAG VILLAGE, SAIPAN, CNMI.

1. A member of the community noted the off-site disposal alternative per the briefing chart says ten months to complete; C. Adams noted it would take four years. Why the discrepancy?

   Lt. Col. Light responded that if funding were in place today, it would take ten months to carry out this alternative. However, US Army Engineer District, Honolulu (USAEDH) must administer to as many as 503 Formerly Used Defense Sites (FUDS) located throughout the Pacific Basin with a budget of approximately $5 million per year to address all those sites. To carry out the off-site disposal alternative (not recommended by USAEDH) would require additional money, which would take up to five years to secure.

2. A member of the community noted Alternative 4E was recommended. Is this the same formula to implement Alternative #5 (3B, On-Site Treatment by Incineration)?

   Lt. Col. Light responded that USAEDH has $6 million now and can probably secure $3 million more, because this site has priority. Funds received each year go to work in progress on the various FUDS within the district. Because of the difficulty in obtaining funds, it may take up to 3-4 years to secure additional monies. However, an additional $3 million should be obtainable a 4-5 month period with relative ease. He does not think that $18 million can be secured that quickly.

3. A community member asked how long would it take to secure the funds to perform the on-site treatment and off-site disposal.

   Lt. Col. Light responded he is not sure, but 3-6 months is likely.

4. A community member asked why are Alternative 2A (Off-Site Disposal) and Alternative 2B (Off-Site Encapsulation with Stabilization) so different in their costs?

   The response was that Alternative 2A (Off-Site Disposal) transports all the PCB-contaminated soil to the U.S. mainland. Alternative 2B (Off-Site Encapsulation with Stabilization) transports the PCB-contaminated soil away from Tanapag, but to some other location on Saipan. Thus, the cost difference between the two alternatives. USAEDH is not recommending either of these alternatives.

5. A member of the community noted that he likes the alternative to remove the PCB-contaminated soil from Saipan. Another member of the community concurred by also stating that the soil be taken away.

6. 6. A community member said that one should not only discuss the PCB-contaminated soil, but also land crabs that live in the soil. A report states that PCBs and heavy metals were found in land crabs (collected from Tanapag Village). Yes, they would like to discuss the treatment/disposal alternatives to address the contaminated soil. But why give them all the options and then tell them they are going to have to wait to obtain the funding? What alternatives are there to get rid of the PCBs?

   P. Adler reminded the community that the purpose of this meeting is to discuss how to remove the PCB contamination in the soil. EPA is prepared to discuss the land crab issue, but not at this point in the meeting. USAEDH tested the soil for heavy metals and only found PCBs.

7. The community member then asked where do the crabs get their contamination from.

   M. Rogow responded that heavy metals were not found in the crabs, but PCBs were.

8. A member of the community noted the people prefer the off-site disposal alternative. Does this mean they will have to wait four years if that alternative is selected?

   Lt. Col. Light responded that the ACE does not currently have enough funding to carry out the off-site disposal alternative. A total of $2.2 billion is needed for all FUDS under USAEDH purview. However, there is only $219 million annually in the national FUDS budget.

9. A community member noted that the military is now admitting responsibility for the contamination.

Lt. Col. Light responded that USAEDH has been continuously working on this project since 1990. USAEDH convened this meeting and has taken the responsibility to carry out the cleanup process. USAEDH, however, does not believe that the U.S. Army was responsible for bringing the PCB capacitors to Tanapag.

10. A member of the community asked if USAEDH is intent on performing on-site treatment of the stockpiled PCB-contaminated soil.

    Lt. Col. Light responded that USAEDH thinks it is the best alternative.

11. A member of the community asked if Alternative 3B (On-Site Treatment by Incineration) would be carried out on the island?

Chris Vais USAEDH has not utilized the incineration process on Saipan before. The incineration process burns the soil. The thermal blanket process is not a form of incineration; rather it is a process that applies heat to the soil.

12. A member of the community asked how much water would be used by the preferred alternative (Alternative 4E).

    Environmental Chemical Corporation (ECC) representatives responded that 6,000 gallons per day on the average would be utilized. Consumption would be 20 gallons per minute, with 150 gallons peak usage. The community member noted that no consumer on Saipan uses that much water and the volume may not be available. Villagers sometimes do not have enough water to shower.

13. A member of the community asked if USAEDH can guarantee the PCB-contaminated soil treated using Alternative 4E (On-Site Treatment by ITD and Off-Site Disposal) will be clean once treated.

    An ECC representative responded that approximately 450 tons of PCB-contaminated soil, as the treatment residue, would be shipped to the U.S. mainland. The remaining soil will be clean following treatment.

14. A member of the community asked the effectiveness of removing PCBs from the soil for all of the alternatives.

    C. Adams responded that No Action is good from a fiscal perspective as there would be no costs associated with this action; however, it does not remove the PCB contamination. Off-Site Disposal is 100% effective as all of the PCBs would be removed from Saipan. Off-Site Encapsulation is 100% effective though all of the PCBs would remain on the island. On-Site Incineration is 100% effective. On-Site ITD and Off-Site Disposal are 100% effective.

15. A member of the community asked for a discussion of the safety of the alternatives. (Note: response was interrupted.)

    The safest treatment/disposal alternative is 4E, which will remove all PCBs. Alternative 3B (On-Site Incineration) is the next safest, but has the potential to produce dioxins. The least safest alternatives are the last two (No Action and Off-Site Encapsulation).

16. A community member asked if they are present to decide on a treatment/disposal alternative.

    Lt. Col. Light responded that USAEDH is present to solicit the public's comments to ensure that the USAEDH is doing the right thing.

17. A member of the community asked if preferred Alternative 4E is based upon cost.

    Lt. Col. Light responded no, that it is not the least costly.

18. A community member recommended USAEDH obtain a bank loan to carry out Alternative 2A (Off-Site Disposal).

    Lt. Col. Light responded that he did not think a loan would be possible. However, other communities have been able to obtain line item funding within a budget. The community can pursue this route. Another member of the community noted that $18 million dollars would not be loaned without interest payments added.

19. A member of the community asked if the treated soil from Alternative 4E (On-Site Treatment by ITD and Off-Site Disposal) will require fertilizer to be added to that clean soil?

    An ECC representative responded that the soil would come out of the process sterile. Fertilizers, chicken manure, etc. must be added to amend the treated soil.

20. A member of the community asked the outcome of the “dead” soil from the ITD treatment process. Will it be spread around and fertilized?

    A representative of ECC replied affirmatively and that it will be deposited at the cemetery. The treated soil would be hydrated, amended with fertilizer, sown with grass, then tilled. The current contract to treat the stockpiled PCB-contaminated soil would include spreading the soil.

21. A community member noted there are three types of criteria used in the selection process. Where does “Community Acceptance” fit in the process?

    Lt. Col. Light responded that USAEDH is evaluating community acceptance now. The four alternatives are being weighed against the community’s acceptance.

22. A community member noted that Lt. Col. Light keeps emphasizing the cost will be expensive. When some of the community met 2-3 weeks ago with one of his staff, a question was raised as to USAEDH’s contingencies should the ITD process fail to work. He accused USAEDH of lying, stating that there is no money, and the cleanup can be completed with less than $18 million. The PCB-contaminated soil can be contained and shipped off-island. He demanded that discussion regarding the four alternatives end. The community wants the stockpiled PCB-contaminated soil shipped off-island. The “CNMI and Community Acceptance” criterion is moot if there is no acceptance.

    Lt. Col. Light responded that USAEDH has $5-6 million available.

23. Benigno Sablan, a member of the Tanapag Action Group (TAG) presented the group’s official written position and signatures regarding the disposition of the stockpiled PCB-contaminated soil by transporting it off-island for treatment or disposal. He stated that TAG believes USAEDH pre-selected a treatment/disposal alternative by acknowledging that TAG members Jerry Crisostomo and Juan Tenorio visited California expressly to view the ITD treatment unit. He continued by stating that TAG believes the unit is being transported to Saipan to conduct a pilot test, the treatment/disposal alternatives presented during this meeting are meant to confuse those in attendance, and that USAEDH has and continues to lie to the Tanapag community. B. Sablan also commented that USAEDH’s $5 million annual FUDS funding makes no sense, raised the issue of PCB-contaminated land crabs, and opined

of widespread contamination on Saipan as a consequence of the island's invasion by U.S. armed forces. He expressed his consternation about USAEDH contracting ECC to treat the stockpiled PCB-contaminated soil despite the firm's indictment and bankruptcy.

B. Sablan then sought a vote of the meeting attendees through a show of hands. P. Adler reminded participants that this meeting was not convened to take a vote.

24. A community member noted that village residents are guardedly optimistic, and have a long history with the issue. Alternative 2A (Off-Site Disposal) is acceptable. Alternative 3B (On-Site Treatment by Incineration) will generate another poison, i.e., dioxin. They believe and are hearing that the ITD unit is on its way to Saipan, and that the treatment method has been pre-determined.

    Lt. Col. Light reiterated that USAEDH selected its preferred alternative, and is what was required of the organization. USAEDH will take the community's comments and consider them. One year ago, USAEDH met with the community and heard the community supported the ITD process on-site. That is why USAEDH went forward with constructing the treatment unit.

25. A community member stated that no one from Tanapag said that.

    Lt. Col. Light noted that the ITD treatment unit can be used it at other sites if the community is opposed to its use on-island to treat the stockpiled PCB-contaminated soil. The equipment is still in California to the best of his knowledge.

26. A member of the community noted that Alternative 2A (Off-Site Disposal) will cost $18 million. Could that amount be reduced if military ships were used to transport of the PCB-contaminated soil? There are military vessels in (waters off) Saipan now and the crews are already paid.

    An ECC representative responded that it had not explored the idea of utilizing military ships for transport.

27. A community member noted that $12 million of the $18 million is for shipping costs. Is the $6 million for processing the PCB-contaminated soil?

    An ECC representative responded that Alternative 2A (Off-Site Disposal) will not treat the contaminated soil. Rather, the soil will be placed in a landfill.

28. On the impact to groundwater, a community member noted that USAEDH's primary goal is to eliminate the risk of PCB contamination and leave the site clean for future use. That individual's opinion is to eliminate the risk by removing the stockpiled material from the site because PCBs will migrate to the groundwater and the contaminant is a soluble compound. Because PCB contamination in the bedrock has not been addressed, he asked how USAEDH is going to realistically remove the risk. He does not think USAEDH has performed comprehensive groundwater, bedrock, soil, and chlorine analyses, opined that it is the obligation of the U.S. government to study the matter, and cited the issue as complex and one that must be discussed with the community. Experts are needed to ensure the facts are accurate and he believes the U.S. government is trying to rush this through the process. An example he cited was the Bikini Island contamination. He recommends conducting a much more comprehensive investigative study of PCB contamination in Tanapag Village.

Lt. Col. Light responded that a groundwater study is forthcoming. A work plan to that end was prepared, is in draft form, and is presently undergoing review.

29. A community member stated that there must be a complete study of the village to make sure it is completely cleaned up. USAEDH must find out how many capacitors were shipped by the U.S. military and compare that to the number discovered in Tanapag Village to date.

30. A community member asked if USAEDH tested for pesticides, herbicides, dioxins, and heavy metals prior to selection of its preferred alternative?

    An ECC representative responded that soil samples were subjected to numerous analyses to determine the presence and concentration of a number of contaminants including pesticides, herbicides, dioxins, heavy metals, VOCs (volatile organic compounds), and SVOCs (semi-volatile organic compounds).

29. A member of the community stated that the rainy season in CNMI is approaching and is concerned about damage to the stockpile covers by typhoons and the regional solar radiation. A request was made to add six inches of soil (crushed coral) over the stockpile covers if treatment/disposal will take a while to complete.

    An ECC representative noted the cover manufacturer's literature states the material is good for two years and is rated for areas exposed to typhoon conditions. If Alternative 4E is used, it is expected that the stockpiled soil will be treated before the cover deteriorates. If another alternative is selected, USAEDH may need to re-visit the life of the covering.

30. A member of the community noted already observing repairs to the stockpile covers.

    An ECC representative responded that the repairs were made following the collection of soil samples from the stockpiles after the impermeable covers were installed. The repaired areas are located where the covers were punctured for sample collection.

31. A member of the community stated that Saipan is always in Typhoon Condition 4, with typhoon-strength winds likely to occur within 72 hours, and asked if USAEDH is aware of that condition? Another asked if Saipan's climatic conditions were taken into consideration when selecting the liner.

    An ECC representative responded that he is aware that Saipan is in Typhoon Condition 4 and that the impermeable cover was selected based on its rated use in such an environment, albeit on a short-term basis per the manufacturer's specifications. Other protective measures must be implemented if it is probable that treatment or off-site transport of the stockpiled soil is prolonged or otherwise delayed.

32. A member of the community asked if the cover material protected the contaminated soil against typhoons.

    ECC representative responded that the preferred alternative would get the soil out of here relatively fast.

33. A member of the community acknowledged competition with other FUDS within USAEDH for funding, and that there is no assurance that monies will be appropriated for the Tanapag Village cleanup as it is unclear as to its priority level.

Lt. Col. Light noted that USAEDH has the funds to implement its preferred alternative and realizes the need to remove the PCB hazard posed by the stockpiled soil on a timely basis to protect the community.

34. A member of the community noted that a request for Superfund monies was made one year ago.

    M. Rogow noted that preliminary evaluation of the data indicates that Tanapag Village may not be eligible for inclusion on EPA's National Priorities List (NPL). An EPA investigation was performed in 2000 and included sampling and analysis of the biota (e.g., soil, fish, crabs, and taro) as well as a soil and groundwater evaluation to determine if the site would score high enough for recognition as a Superfund site. The data evaluation by EPA is ongoing to ascertain the village's relative ranking. EPA is waiting to see if the soil will remain here. It appears the risk from the soil has been removed, but the agency is awaiting the results. EPA hopes to have the final documents within a few months.

35. A community member noted that EPA has not performed a risk assessment.

    M. Rogow responded that it is an evaluation process.

36. A member of the community asked how far along is Tanapag Village in the process for its inclusion on the NPL.

    M. Rogow responded that EPA has not completed its final scoring for the site. The agency is awaiting more groundwater data. The levels of PCB contamination in village soils are low when compared to national levels, but data analysis is incomplete. Data gaps have been identified and must be resolved for a complete analysis. She said she could respond to TAG with the information, but concluded that it does not appear that Tanapag Village will qualify as a Superfund site.

37. A community member commented that information on high risk factors may bring in money faster.

38. A member of the community asked if the low rating is because the PCB contaminated soils are now contained in the stockpiles.

39. The community member then asked if the community can obtain that information as well as a description of the evaluation process.

    M. Rogow responded that the report should be out within the next few months, but reiterated that it does not appear that Tanapag Village will rank high enough to be placed on the NPL. EPA, however, is currently collecting more information to assist the agency in ranking the village.

    Lt. Col. Light noted that last year USAEDH spent $5 million on the Tanapag Village cleanup, and considers this the number one site out of the 503 FUDS.

40. Juan Tenorio, a TAG member who visited ECC's ITD unit in California, expressed his frustration regarding the potential for not being listed as a Superfund site citing analytical data from 1998 and 1999 samples would justify a ranking sufficient for NPL inclusion. He also expressed concern regarding Alternative 4E (On-Site Treatment by ITD and Off-Site Disposal) and its potential inability to effectively treat the stockpiled soil, though is pleased that the overall cleanup process is at its present stage.

An ECC representative responded that the ITD equipment J. Tenorio et al. visited is a third generation unit. There are spare parts available from the U.S. mainland that can be shipped to Saipan in short time. Questions about damage to the ITD unit while in transit to Saipan or by a typhoon once erected have been addressed in the planning process. Any catastrophic damage to the unit could be repaired within two months.

41. Community members noted that previous discussions addressed the environmental differences between Tanapag Village and sites in the mainland U.S. where the ITD process was employed, and asked what USAEDH would do if the ITD process does not work on Saipan.

    Lt. Col. Light responded that the evaluation process would be reactivated to address the remaining alternatives identified during the focused feasibility study and perhaps new treatment technologies that may become available at that time. However, USAEDH believes the ITD process will work. If it does not, USAEDH will stand by its responsibility to treat or dispose the stockpiled PCB-contaminated soil through other methods.

42. A member of the community asked to what extent can USAEDH can accomplish in treating the stockpiled soil utilizing Alternative 4E (On-Site Treatment by ITD and Off-Site Disposal) with available funding?

    Lt. Col. Light responded that USAEDH has available and intends to spend $5-6 million for treatment of all the stockpiled soil.

43. A member of the community asked what will happen in the next eight months.

    Lt. Col. Light responded that the process would include taking comments from the public and providing EPA with a preferred alternative for the agency's consideration. USAEDH's contractor can mobilize 60 days after EPA grants its approval of the preferred alternative. The 20,000 tons of stockpiled PCB-contaminated soil would be treated within four months. Most of the water used in the treatment process will be made up of rainwater.

44. A community member asked if there was consideration given to the price and availability of fuel.

    An ECC representative responded that regional fuel suppliers contacted have made assurances about the availability of fuel.

45. TAG member Juan Tenorio thanked USAEDH and its contractors despite differences in opinions and resultant frustrations. He opined that it has not been easy living in an environment with known health concerns and believes the community should be given the benefit of the doubt in this matter. He also stated that this meeting went well and was very educational.

3.7 RESPONSES TO MS. RUTH TIGUE'S COMMENTS ON THE INTERIM DRAFT TREATMENT PLAN, TANAPAG VILLAGE, SAIPAN, CNMI.

The following are provisional responses to comments. These responses assume that the USEPA and the Department of the Army (DA) will, under their authorities, approve the remedy selection of Indirect Thermal Desorption (ITD) followed by shipment of the residual filter cake (400 tons) to the US mainland. If this remedy is not approved, these answers will require revision.

Comments on Health Risks.

Unfortunately, some of the discussion in the Proposed Plan regarding risk levels is speculative or in error, as pointed out in these comments. USACE did not complete a full site specific risk assessment for this site. This is in part because the EPA order mandates the cleanup level of 1 ppm. The EPA order is based on an EPA Region 9 preliminary remediation goal (PRG) for determining the need to proceed with site investigation, and is consistent with the Toxic Substances Control Act (TSCA) which governs the management and disposal of PCBs and PCB contaminated material. 1 ppm is consistent with or lower than the cleanup level for PCBs used by EPA and other federal agencies at many National Priorities List sites throughout the United States. Data indicates that the ITD process will achieve less than 1 ppm to non-detect. Soils that fail to reach this goal will be reprocessed until they meet the remediation goal or they will be shipped off island. This level of remediation will be protective of human health and the environment for any use of the treated soils. USACE believes that the EPA-ordered cleanup level complies with CERCLA and the NCP and is protective.

Section 1.2 The third paragraph says that vapors consist of contaminants and particulate matter. What is this? The same paragraph mentions a HEPA particulate filter. What is this?

HEPA stands for High Efficiency Particulate Adsorber. HEPA filters are used in clean rooms and are 99.98% efficient to remove dust below 1 micron.

The same paragraph mentions that "water is polished prior to use to re-hydrate treated soil." What does this mean?

Water polish defines the use of activated carbon to remove impurities of the water treatment system. Water that has been treated is sprayed on the hot soil exiting the ITD to add moisture to the soil as well as cool the soil. The soil is re-hydrated to the same moisture content it had before treatment.

Mention is made of minimizing excess hazardous materials storage by shipping only limited quantities over the length of the project. What protective measures will be provided for the storage of the hazardous materials on-site?

Department of Transportation (DOT)-approved containers will be used to store the waste for shipment, and placed in sea vans for offsite transportation. Industry standard hazardous materials management protocols will be followed during packaging, storage and shipment, including but not limited to, securing storage areas to prevent unauthorized entry by the public, maintaining the DOT limits on transport vessels and others, and maintaining “cradle-to-grave” management of the controlled waste.

Where will the clean soil that is to be used in the initial test come from? How much will be needed? What happens to it upon completion of the test? If it is then sterile, will it be "amended" so that it is again fertile?

Clean soil will be purchased or clean cover surrounding the cells will be used to conduct the initial test. Approximately 100 tons will be used and upon completion of the test the soil will be commingled with the treated and verified clean soil. The sterile soil will be amended at the upper layers to restore it for use in cultivation.

This section states that ECC will operate the system at 75% of the design conditions while awaiting results of the regulatory agency reviews of the demonstration test. I was told that this will not occur, but have seen no confirmation in writing. While mention is made of a mini-test to validate the performance of air pollution controls systems, no mention is made of certifying that the PCB content of the soil has been reduced to 1 ppm or less. In fact, this section talks only of validating the meeting the "emission expectations." Shouldn't the test also validate the degree to which the soil has been cleaned?

No operations will occur upon completion of the demonstration testing. The mini test has been eliminated, only the full-scale performance test will be performed. Soil analytical results are continuously performed. Only soil that meet a standard of less than one ppm PCB will be backfilled. Soil exceeding 1 ppm will be retreated in the ITD.

Section 2.1.1 states that fuel will be stored in two existing fuel oil storage tanks near the site. Yet Section 3 states that two 6 thousand-gallon oil tanks will be installed to store fuel oil. Which is it?

Two 4000-gallon tanks for diesel storage will be made available. Shell Oil Company will supply.

This section also states that ECC may boost water pressure to meet its needs. How will this be done? How will ECC avoid this having an adverse on the water supply for the village?

ECC is exploring the possibility of using other sources of water, such as drilling a well, or a tank for storing rainwater. For example, pursuant to consultation among ECC, the CNMI Commonwealth Utilities Commission (CUC), and the DEQ, it appears it will be necessary to install a well to draw brackish water from the tidal aquifer in order to operate the ITD unit. Use of this non-potable water will avoid an adverse impact on the community's drinking water supply.

This section states that "Materials used in the process...are planned to meet production." What does this mean?

Materials will be purchased and stored on-site to meet production needs. This refers to the supplies and tools necessary for the treatment operations.

This section states that ECC has identified an adequate work force from an "on-island labor pool." What is this? Will foreign labor be used? Will the normal process for obtaining/hiring these workers be followed?

ECC will use subcontracted labor sources as well as citizens, and will follow federal and CNMI labor laws.

Section 2.1.3 states that there will be scheduled outages every 10 days for 1-2 days. It also notes that at 60% availability, the system can be offline 4 out of every 10 days. Under such a schedule, is there really any point in trying to maintain operations 24 hours a day?

The 60% number for availability is an average over the life of the project. In some cases the outages may be longer than 1-2 days. Operation 24 hours per day will yield the cleanest soil exiting the ITD. Frequent start and stops increase the project duration and quantity of soil to be treated since high retreat of soil is typical.

Section 3 states that soil treatment rate will be at 14 TPH. What is this?

TPH is an acronym for tons per hour. The average treatment rate including availability is 14 x 60 / 100% or 8.4 tons per hour of calendar time.

The section says the ITD is a zero process water discharge operation. But it also states that 20,000 gallons of water will be required for start up. What will happen to this water?

20,000 gallons of start up water will be used to fill the tanks needed for the ITD. The water collected in the ITD process will be treated and used to hydrate the soil exiting the unit.

This section also states that no process water exits the ITD. Yet the next sentence states that a discharge drain will be established to accept this non-contact water discharge, and goes on to note that water disposal will follow requirements of Federal and CNMI regulations. Please explain the inconsistencies!

Contact or process water is defined as water that has been in contact with PCB wastes. This water is sent back into the system and cleaned before it is used to re-hydrate the soil.

Non contact or non-process water is used to cool the process water through a metal heat exchanger in a way to prevent the two water types from touching each other. The non-contact water is re-circulated through a cooler. The water is clean except the level of dissolved salt is higher. This water may be discharged through the discharge drain periodically, and will meet the federal and CNMI discharge specifications.

Sec 3.1 discusses installation of the container components. Who will do the installation? What kind of training will they have/receive? What kind of supervision will be provided?

ECC will do the installation of the equipment. Experienced ECC superintendents will supervise subcontractors and local hired labor to assist in the process. Training will be conducted on HAZWOPER and on-site operations.

Section 4.1 states that "the indirect process creates a potentially explosive gas" therefore making stoppage of the system "undesirable." How will ECC assure that the system doesn't stop inadvertently - especially given the unreliability of local power? Can ECC issue such an assurance? What protection will be provided against possible explosion of the gas?

ITD system has been equipped with safety features that eliminate the possibility of explosion. The system is continually purged with an inert gas during operation to eliminate the oxygen needed to ignite or cause an explosion of a vaporized organic material. A backup generator is used to permit a safe and orderly shutdown of the ITD equipment in the event of a power failure.

Section 4.4 states that treated soil will be sampled for clean-up level every 50 tons, which will be a composite of 250 tons. Is this a standard rate of sampling? Is it enough?

The section talks of regulatory testing, performance testing and operational testing. Please define the components of each.

This section ends with the statement: "Information will be developed that will allow ECC to maximize the PCB removal and still meet soil discharge criteria." What does this mean?

Soil sampling of every 50 tons /250 ton composite is a standard treatment rate for continuous treatment processes. The process parameters are continuously monitored and parameters that fall out of specification stop the introduction of soil, and therefore eliminate the possibility for soil failing the treatment criteria. The information that will be developed to meet soil discharge criteria are the parameters mentioned. These include soil discharge temperature before cooling, retention time (or time the soil is in the ITD system). The purpose of developing the criteria is to reduce the frequency of treated soil not meeting the treatment criteria.

Regulatory testing is the validation of discharge of a stream such as water and air. This testing is ongoing throughout operations. Performance testing is an initial set of tests to assure the *equipment meets the standards of performance that were planned during the regulatory review process. The standards that must be met are PCB, dust, metals and dioxin furans, carbon monoxide, oxygen and hydrocarbon emissions from the process in the air system.*

Section 6.2.2 talks of data taking "throughout the shift on a timely basis but not overly time-consuming"; and of the frequency of inspection "at least as often as specified in ...regulations," but then says they will be carried out often enough to identify problems in time to correct them.... These are rather vague indicators, and unsatisfactory.

ECC will take data on a routine basis throughout the project to monitor system parameters and to check if the project objectives are being met. This will be used to document the results, or to change procedures or system components if warranted.

Detailed inspection and report forms will be attached to the ITD plan. Vague reference will be removed.

Section 3.1 lists "definable features" of the scope of work for Phase IV. Not included is any mention of restoration of the site of the stockpile after treatment and removal of all equipment, nor does it discuss restoration of the cleaned, but sterile, soil to its previous organic condition, both of which should be included in the plan.

Soil will be amended with compost and/or fertilizer to restore it to organic state. ECC will add this requirement to the revised document.

Section 3.2 notes that "corrective action" will be taken to bring data that does not meet QA objectives to an acceptable level. Does this corrective action include regenerating the data, should that become necessary?

Data that does not meet QA objectives will not be modified, but documented and excluded from site data evaluation. Corrective actions are measures taken to amend field or other procedures to prevent erroneous data from recurring.

Section 4 lists as a sampling strategy “sampling requirements for Incineration Waste Disposal." At what point is incineration going to be used as a waste disposal strategy?

Incineration is no longer mandated. Wastes will be disposed at a TSCA landfill, after confirming that it meets the TSCA landfill acceptance criteria.

4.2 indicates that only one representative sample of each type of debris and of filter cake will be taken per disposal facility requirements. What is the purpose of this sampling? What happens to debris that does not meet the criteria for TSCA / RCRA disposal? Is one sample adequate for this purpose?

One composite sample per load of filter cake will be collected and analyzed. This will be representative of the specific waste stream.

Sec 4.3 indicates that only one representative sample of waste in "roll-off containers" will be taken. What is the purpose of this sampling? Is one sample adequate for this purpose?

The “roll-off containers” will contain pre-classified non-hazardous waste. The sample will be a composite sample of the entire contents of the container and therefore representative of the contents within.

Where do these sampling "ratios" come from?

Will sampling results be made available to the public?

The sampling "ratios" are based on the requirements of the receiving facility. All results will be made available by the EPA after ECC submits the final report.

Section 3 states that metal debris will be decontaminated and sent to a local re-cycling center located at Lower Base. How will this decontamination be done? How will it be determined that the debris is free of contamination?

General decontamination will include a high-pressure wash followed by a metal wipe sample to determine residual concentrations. Once shown to be clean, the metals will be recycled.

Section 5.3.2 mentions verification sampling. Will EPA also be taking verification samples? If not, why not? Will sampling results be made available to the public?

Yes, EPA will collect and analyze samples concurrently with the site activities, and will make the results available to the community.

Section 7 notes that green waste will be separated and treated to create a mulch-type product. What happens to the mulch? Will it also be treated in the thermal treatment unit?

Composite samples of the mulch will be analyzed. Depending on the characteristics, the mulch will either be added to the soil to restore organic content, or be treated by the ITD unit.

Section 9.4 states that there will be a permanent stockpile of treated soil. Where will this be located? Whose responsibility will the soil become? Why should the stockpile remain permanently? Aren't there abundant uses for clean soil?

This section also mentions a Construction Work Plan. When will this become available for public comment?

Soil will no longer be stockpiled, but will be spread around the site after treatment at a location to be determined by USACE.

Any pertinent plans drafted by ECC will be made available to the public at a future date.

3.8 RESPONSE TO THE TANAPAG ACTION GROUP'S (TAG) COMMENTS ON THE FOCUSED FEASIBILITY STUDY AND PROPOSED PLAN FOR REMEDIATION OF PCB CONTAMINATED SOILS AT TANAPAG VILLAGE, SAIPAN, COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS.

1. TAG Position of the Focused Feasibility Study.

The Tanapag Action Group, adopted the unanimous vote of 68 and the over one thousand signatures of the Tanapag residents to ship all 20,000 tons of PCV (sic) contaminated soil to off island treatment location, when appropriate on-site expertise and equipment availability.

The pilot project for testing of indirect thermal desorption machinery must be conducted off island treatment location, where appropriate on-site expertise and equipment availability.

The Army has significant difficulty implementing this alternative. First, the funding is not available. The Honolulu Engineer District (HED)'s annual budget FUDS budget is $5 - 6 million. These funds are shared among all active FUDS projects in the district, based on risk *determined priority. The cost to implement this alternative is about $18,000,000. We don't believe we can get funding for this alternative in the foreseeable future, perhaps in four years, perhaps longer.*

The other significant problem with implementing this alternative is logistics.

The logistical difficulties with shipping 20,000 tons of PCB contaminated soil are very significant. We would need to barge about 1500 containers of contaminated soils from Saipan to Guam. The Guam EPA has indicated in its comments on this project's FFS and proposed plan that it is not amenable to the prospect of addressing the management, handling, and storage of this quantity of contaminated soil on Guam or in its harbor facilities. We would need to obtain the necessary Guam permits to transit these soils through Guam. In fact, because of the quantities of soil and the time involved, we would need to obtain a TSCA storage facility on Guam.

If we could surmount the substantial problems with bringing this material through Guam, we would ship the soil to the US mainland for final disposal. Obtaining permits and permission to bring this quantity of soil into a US mainland port would also be difficult, in part because of the sheer quantity of the soils. In addition to working out consent to enter a port, we would need to obtain a US Department of Agriculture permit to bring the soils into the US. This would require a significant testing effort and protocol to assure the USDA that the soils did not contain prohibited microorganisms or other threats to US agriculture. In addition to the USDA requirements, once we sent this material off the Tanapag site, we must test each container (say 1500 containers) in accordance with DOT regulations. If the material tests less than 50 ppm, we would send it to RCRA permitted landfill. If it tests above 50 ppm, we would have to send it to a very costly TSCA permitted landfill.

For all of these reasons, the shipping logistics between Saipan and Guam and Guam and the US mainland would be very time consuming and costly to work out. This alternative would require much more funding that we have or than we may be able to obtain through the FUDS program. It would also take an unreasonable amount of time to execute this alternative.

2. Land Crab Survey

The edible crabs survey were found to be contaminated with PCB. All areas affected must be survey for other food sources contamination and further soil testing of COC must be conducted. Find sources of PCB and COC, characterize and remediate all COC.

USEPA undertook a substantial sampling effort of soil, water, and foodstuffs at Tanapag. Their findings are reported in the Final Field Sampling Report, Screening Level PCB Multi-Matrix Survey of Tanapag Village Areas. USEPA evaluated surface soil, stream sediment, lagoon sediment, concrete, ground water, surface water, fish, clams, landcrabs, chicken eggs, yams, and taro root. PCBs were found in some of the soil. The Corps evacuated soil containing greater than 1 ppm of PCB and stockpiled it for treatment.

No PCBs were found in the surface water samples. No PCBs were found in the ground water samples, but the wells were not located near to sites in Tanapag that were contaminated, so the Corps will conduct additional groundwater sampling to determine whether there is any PCB contamination in the groundwater at Tanapag.

No PCBs were detected in the clam, fish, or chicken egg samples. Trace levels of PCBs were found in one of nine taro and six of nine yam samples, but were not identifiable as a specific Aroclor, and were at levels far below USEPA's risk-based consumption limits for food.

Aroclor 1254 and 1260 were found in five of eight landcrabs collected near Cemetery 2 in May 2000, at concentrations between 0.078 to .039 mg/kg. Additional landcrabs were collected from four locations in Tanapag in December 2000 and analyzed for PCBs.

Background or reference samples from Smiling Cove tested between non-detect and 0.005 mg/kg of PCB. Crabs taken from the Cemetery 2 area tested between 0.004 to 0.032 mg/kg of PCB. Landcrabs taken near the Beach Park (SS-TT excavation area) tested between 0.004 to 0.960 mg/kg of PCB. Landcrabs taken near the southern stream tested 0.001 to 0.011 mg/kg. Landcrabs taken near Achugao Stream tested non-detect to 0.035 mg/kg.

Based on these results, the CNMI Department of Public Health has issues a health advisory warning residents to avoid consuming landcrabs.

The soil contaminated with PCB has been excavated. It is reasonable to expect that the PCBs in landcrabs will diminish as they go through several lifecycles from this point forward. Sampling of landcrabs should be done in the future to confirm whether this has taken place. USEPA's reported standard for unlimited consumption is .002 ppm, and the U.S. Food and Drug Administration's tolerance for PCB in the edible portion of fish and shellfish is 2.0 ppm, 21 CFR 109.30(a)(7) (1996).

At the community's request, portions of the landcrab samples were analyzed for 22 metals. The USEPA survey found that aluminum, iron, and manganese were higher in the landcrabs taken from Tanapag than in those from Smiling Cove, but they are not present at concentrations which are known to pose a significant risk to people who eat landcrabs. The Smiling Cove crabs contained higher levels of animony. No significant differences among the samples existed for heavy metals of concern including cadmium, chromium, lead, and mercury. No samples analyzed for any of these 22 metals were reported to reach a level of concern that would impact human health or the environment.

Soil Dioxins and Furans were also tested for and analyzed. The findings concluded that the concentration of dioxin/furans found in the soils are well below USEPA's threshold for acceptable risk in dioxin-contaminated soils. One furan congener of concern was found above the limit of detection, but its toxicity equivalence concentration is well below the residential soil remediation goal of 1 part per billion per 1998 USEPA Office of Solid and Hazardous Waste and Emergency Response (OSWER) Directive 9200.4-26.

Based on these sampling efforts, no additional surveys, including landcrab surveys, are necessary at this time. The Department of Defense Environmental Restoration Program (DERP), Formerly Used Defense Sites (FUDS) is only authorized to investigate and remediate contamination caused by a DOD activity that qualifies under the FUDS criteria for remedial action. FUDS is not a general environmental restoration program such as the Superfund.

3. Fuel Farm Contamination Survey.

According to site investigation of Tanapag Fuel Farm, TFF, heavy metals are present, edible crabs are found to be contaminated both PCB and COC, e.g., dioxin, dibenzofuran, chlorobenzenes and didenzofurans PAH etc. TAG demands further investigation and actual characterization of contaminated soil and organisms involve in the diet of the Tanapag residents.

The Final Report of the Site Investigation, Tanapag Fuel Farm, Saipan, CNMI, reports the data collected from sampling for petroleum products and metals. Chapter 7 of the report states the conclusions of this effort to confirm whether soil and groundwater contamination might be present from the past operation of the fuel farm. A total of 42 tank sites were identified during this investigation out of a total of 44 referenced in historic documents prepared for and on the site. Soil and/or groundwater sampling was conducted at 21 of the 42 sites identified. Sampling was concentrated at those sites where evidence of the original tank or berm structure remains.

The report concludes that metals regulated by the Resource Conservation and Recovery Act as solid or hazardous wastes are generally unremarkable. Somewhat elevated levels of lead may be present in surface soils located close to deteriorating tank remnants.

Petroleum hydrocarbons were detected in soil samples collected at approximately 15 tanks and at the Sadog Tasi site. No BDEX was detected in any soil sample collected during the investigation. TPH was detected in ground water at Tank 13. No BDEX was detected in any groundwater sample. Based on the results of the investigation, it appears that the only petroleum hydrocarbon contamination in the soils is associated with the fuel oil tanks. The groundwater beneath the site appears to be free of petroleum hydrocarbon contamination with the exception of the area near Tank 13.

The historic military inspection reports suggest that by the late 1940s, significant product loss was occurring at the fuel farm. This loss plus the nearly 1 million gallons in non-pumpable fuel offer the potential for significant contamination to be present at Tanapag. However, the absence of BDEX and TPH in the groundwater suggests that large-scale historical contamination at the site never occurred or has been remediated by natural degradation and attenuation processes. The only evidence of historic spillage detected during the investigation is in the immediate vicinity of the fuel oil tanks.

This project is in the FUDS inventory. It will be processed for consideration based on its relative risk to human health and the environment compared with other FUDS projects' risk. The projects posing the most serious risks to human health and the environment are funded first.